CITY OF SWEET HOME
CITY COUNCIL
AGENDA

February 14, 2023, 6:30 PM
Sweet Home City Hall, 3225 Main Street
Sweet Home, OR 97386

WIFI Passcode: guestwifi
PLEASE silence all cell phones – Anyone who wishes to speak, please sign in.

Mission Statement

The City of Sweet Home will work to build an economically strong community with an efficient and effective local government that will provide infrastructure and essential services to the citizens we serve. As efficient stewards of the valuable assets available, we will be responsive to the community while planning and preparing for the future.

Meeting Information

The City of Sweet Home is streaming the meeting via the Microsoft Teams platform and asks the public to consider this option. There will be opportunity for public input via the live stream. To view the meeting live, online visit http://live.sweethomeor.gov. If you don't have access to the internet you can call in to 1-971-203-2871, Meeting ID: 321 716 901#

This video stream and call in options are allowed under Council Rules, meet the requirements for Oregon Public Meeting Law, and have been approved by the Mayor and Chairperson of the meeting.

I. Call to Order and Pledge of Allegiance

II. Roll Call

III. Consent Agenda:

a) Request for Council Action - Patrol K-9 Quote and Purchase

a) Approval of Minutes:

i) 2023-01-24 City Council Minutes

IV. Recognition of Visitors and Hearing of Petitions:

a) Swearing In Ceremony - Captain Ryan Cummings

V. Old Business:

VI. New Business:

a) Request for Council Action - Mahler WRF Interim Improvements Project - Final Design Task Order

b) Request for Council Action - Mahler WRF Electrical Equipment Procurement

c) Request for Council Action - Mahler WRF Sludge Blend Tank Design-Build Procurement

d) Request for Council Action - Mahler WRF Dewatering Equipment Procurement

e) Request for Council Action - Resolution No. 2 for 2023 - A Resolution for RV Signage

VII. Ordinance Bills

a) Request for Council Action and First Reading of Ordinance Bills

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The location of the meeting is accessible to the disabled. If you have a disability that requires accommodation, advanced notice is requested by notifying the City Manager's Office at 541-367-8969.

i) Request for Council Action - Ordinance No. 6 for 2023 - Ordinance Necessary for RV/Travel Trailer Parking Enforcement.

ii) Request for Council Action - Ordinance No. 7 for 2023 - Legislative Amendment LA22-02 Mobile Food Units

b) Second Reading of Ordinance Bills

i) Ordinance No. 4 for 2023 - Code Updates

c) Third Reading of Ordinance Bills (Roll Call Vote Required)

i) Ordinance No. 5 for 2023 - Amending Section SHMC 3.08.070

VIII. Reports of Committees:

Ad Hoc Committee on Health

Ad Hoc Committee on Arts and Culture

Administrative and Finance/Property

Traffic Safety Committee

Area Commission on Transportation

Chamber of Commerce

Charter Review Committee

Council of Governments

Library Advisory Board

Park and Tree Committee

Solid Waste Advisory Council

Youth Advisory Council

IX. Reports of City Officials:

City Manager's Report

Mayor's Report

X. Department Director's Reports (1st meeting of the Month)

Library Services Director

i) Library Director's Monthly Report - January

Community and Economic Development Director

i) Community and Economic Development Monthly Report - January

Public Works Director

i) Public Works Monthly Report - January

ii) Mahler WRF Project Monthly Report - January

City Attorney

XI. Council Business for Good of the Order

XII Adjournment

REQUEST FOR COUNCIL ACTION

Title:	Patrol K-9 quote and purchase
Preferred Agenda:	February 14, 2023
Submitted By:	Jason Ogden, Chief of Police
Reviewed By:	Kelcey Young, City Manager
Type of Action:	Resolution ___ Motion __X__ Roll Call ____ Other ____
Relevant Code/Policy:	SHMC 9.20.020 Unnecessary Noise
Towards Council Goal:	Goal 2: BE AN EFFECTIVE AND EFFICIENT GOVERNMENT 1. Update and streamline processes. 2. Develop continuity in planning and permitting processes. 3. Invest in long-term staff stability and training. 4. Develop transparency in all communication. 5. Continue to implement financial “best” practices. 6. Employ sound technology to maximize efficiency.
Attachments:	Tarheel Canine Training, Inc. Quote

Purpose of this RCA:

Council decision and approval of Tarheel Canine Training quote.

Background/Context:

The Sweet Home Police Department has had a successful K-9 program for several years. However, with the retirement of narcotic detection K-9 Gemma in August 2022, the department has been researching a replacement and has decided to implement a patrol K-9 program. The goal is to invest in a high-quality dog backed by a lifetime guarantee, and the department has narrowed down its choices to three different businesses with the help of other law enforcement agencies in Oregon. It's worth mentioning that the department currently has approximately $19,000 in donations from the public in its K-9 fund.

The Challenge/Problem:

The challenge or problem associated with this request has to do with getting the highest quality dog possible from a reputable business at a reasonable cost. The three businesses we have quotes from are the following:

1. Alderhorst International - $12,930

2. Tarheel Canine Training – $14,345 or (if paid in full there is a 5% discount which would adjust the total to $13,627).

3. Golden Gate Canine - $20,000

We respectfully request council's approval for the Sweet Home Police Department to purchase our K-9 through Tarheel Canine Training, which would cost approximately $697 more than our lowest quote from Alderhorst International. Tarheel Canine Training offers a lifetime guarantee of the dog if kept in good health, which the other two companies do not offer. Furthermore, Tarheel Canine Training is highly recommended by other Oregon law enforcement agencies, including the Bend Police Department, which has already purchased three dogs from them in the past year and plans on getting at least one more this year. The Bend Police Department has expressed their satisfaction with the quality of dogs from Tarheel Canine Training.

Stakeholders:

- Community – Communication is vital for transparency and public involvement.
- Police Department Staff – There is a need for a new patrol K-9
- Council – Council support for purchasing our K-9 through Tarheel Canine Training

Issues and Financial Impacts:

The cost to purchase a patrol K-9 would be $13,627. This comes from donations that we have received from the public for the K-9 program.

Elements of a Stable Solution:

A stable solution includes purchasing a dog through a reputable source that will allow us to continue our program to provide the highest level of police services to our community.

Options:

1. *Approve police department staff to purchase a patrol K-9 from Tarheel Canine Training*.

2. *Deny the request.*

3. *Direct staff to research other ways to accomplish the same goal.*

Recommendation:

Staff recommends option #1 – Approve staff to purchase a patrol K-9 from Tarheel Canine Training.

CITY OF SWEET HOME
CITY COUNCIL
MINUTES

January 24, 2023, 6:30 PM
Sweet Home City Hall, 3225 Main Street
Sweet Home, OR 97386

WIFI Passcode: guestwifi
PLEASE silence all cell phones – Anyone who wishes to speak, please sign in.

Mission Statement

The City of Sweet Home will work to build an economically strong community with an efficient and effective local government that will provide infrastructure and essential services to the citizens we serve. As efficient stewards of the valuable assets available, we will be responsive to the community while planning and preparing for the future.

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This video stream and call in options are allowed under Council Rules, meet the requirements for Oregon Public Meeting Law, and have been approved by the Mayor and Chairperson of the meeting.

Call to Order and Pledge of Allegiance

The meeting was called to order at 6:30 PM.

Roll Call

PRESENT
Mayor Susan Coleman
President Pro Tem Greg Mahler
Councilor Dave Trask
Councilor Lisa Gourley
Councilor Angelita Sanchez
Councilor Dylan Richards
Councilor Josh Thorstad

STAFF
City Manager Kelcey Young
Community and Economic Development Director Blair Larsen
Administrative Services Director Julie Fisher
Communications Manager Adam Leisinger
Interim Finance Director Matt Brown
City Attorney Robert Snyder
Library Services Director Megan Dazey
Chief of Police Jason Ogden

The location of the meeting is accessible to the disabled. If you have a disability that requires accommodation, advanced notice is requested by notifying the City Manager's Office at 541-367-8969.

Consent Agenda:

Motion made to approve the Consent Agenda by Councilor Richards, Seconded by President Pro Tem Mahler.
Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Richards, Councilor Thorstad

a) Request for Council Action – OpenGov Procurement Software

Approval of Minutes:

a) 2023-01-10 City Council Minutes

Recognition of Visitors and Hearing of Petitions:

City Manager Kelcey Young recognized Cindi Robeck for going above and beyond in her duties as well as taking on additional duties. Cindi has been instrumental in all areas of finance at every level. She has worked during holidays and almost every weekend. She has provided oversight and institutional history in so many areas. She has provided excellent service with positivity while leading her own team. Cindi was awarded with a City of Sweet Home Challenge Coin.

Vince Adams spoke to show support for the three ordinance that are about to be adopted. Mr. Adams also spoke about the dangers of wrong way parking on streets and avenues in residential areas. He also had concerns of vehicles parked blocking sidewalks.

Old Business:

None

New Business:

a) PUBLIC HEARING: Resolution No. 1 for 2023 - A Resolution Adopting a Supplemental Budget for FY 22/23

The Public Hearing was opened at 6:39 PM.

Mayor Coleman asked if any of the Council had any exparte, personal bias and conflict of interest. There was none.

City Manager Young presented a staff report. City Manager Young highlighted key points stating the New Supplemental Budget is for $40.60 Million which is a decrease of $1.58 Million from the FY 21/22 Budget.. Changes include the overall organizational structure, fewer funds and accounts, and transfers have been completed.

The additions being requested are for a new police officer position, small amount for abatements, capital improvement for the police station, and capital improvement for ADA access at City Hall.

CM Young highlighted the reserves which total $18,615,000.

Interim Finance Director Matt Brown explained the Supplemental Budget in depth. Each fund was reviewed, along with each department. ORS standards were reviewed, personnel services, material services, and capital outlay were combined into "operations".

Public Comment. There was none.

The Public Hearing was closed at 7:17 PM.

Mayor Coleman thanked staff for providing the summary and the budget which is transparent.

b) Department Head Presentation Reports

Each Department Head gave a quick overview of the 2022 year in review.

The Library discussed programs including the Summer Reading Program, Story Time, My First Library Card, 1000 Books Before Kindergarten and so many more. Volunteer hours exceeded 528 hours. 606 new library cards were issued during 2022. Challenges the Library is facing includes the need for additional space and staffing.

Chief Ogden presented the 2022 overview of the police department. the police department had a challenging year with staffing needs. Chief Ogden noted the efforts of the community that added to the department's success. The department responded for 9,600 call for service during 2022. Chief Ogden reported there are still two officer positions open. Six officers were hired last year. There were three Life Saving Awards presented. A new Chief of Police was hired. The department also was able to solve an armed robbery in less than 18 hours.

City Manager Kelcey Young presented the Public Works report for Public Works Director Springman who was not in attendance. Some of the highlights were the finalizing of the Water and Stormwater Master Plans, the Small Diameter Water Main Replacement Project, and the Water Treatment Plant Project. Other department project included the Water Meter Modernization project. The Northside Dog park is open and operational. Many of the FAC facility improvements are also credited to Public Works Staff.

Community and Economic Development Director Larsen presented the 2022 year end report his department. Each part of the department was highlighted, Planning, Building, Engineering, Code Compliance and Economic Development. Department staff was introduced. Some of the highlights included the adoption of a Streetscape Plan, a new Development Code, and the sale of the Willamette/Weyerhaeuser Mill site. Grand funded projects included the Streetscape Plan, Sankey Park, Housing Needs Analysis, Transportation System Plan and Park System Master Plan. In 2022 there were 36 single family homes built which is the highest in five years.

City Manager Young presented the Executive Department report which highlighted staff tenure and awards in 2022. There were 9 employees that completed their first year of service, 2 employees were recognized for 5 years of service, 4 employees for 10 years of service, and one employee recognized for 20 years of service. CSO Sean Morgan received the police employee of the year award for 2022. Three officers were presented with Lifesaving Awards, which speak to the talent and dedication of our officers.

c) Request for Council Action – Security Services Contract for FAC

Community and Economic Development Director Blair Larsen reported as part of the MOU with the FAC, the City agreed to take on security for night time. An Request for Proposal was published and a bid was received from NightHawk Security. There were two proposals. One was for the FAC Facility only, the other included a patrol car for additional security such as the old city hall facility.

Motion made to approve the contract with NightHawk Security for only the FAC facility by Councilor Richards, Seconded by Councilor Trask.
Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Thorstad
Voting Nay: Councilor Richards

Ordinance Bills

Request for Council Action and First Reading of Ordinance Bills

a) Request for Council Action - Ordinance No. 4 for 2023 - Code Updates

Community and Economic Development Blair Larsen presented an update code to aide in Code Enforcement efforts.

New language clarifying open burning, open storage, nuisances, glass windows and doors at 6', parks, and dangerous trees, were explained.

Motion made to move to first reading by Councilor Richards, Seconded by Councilor Thorstad.
Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Richards, Councilor Thorstad

The Ordinance was read in its entirety.

Motion to move to second reading by Councilor Richards, Seconded by Councilor Thorstad.
Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Richards, Councilor Thorstad

b) Request for Council Action - Ordinance No. 5 for 2023 - Amending Section SHMC 3.08.070

City Attorney Snyder explained the reason for the updates to SHMC 3.08.070. Language was clarified for future clean up of all public properties that allow the discard items of no value without notice as per state law.

Motion made by Councilor Gourley, Seconded by Councilor Richards.
Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Richards, Councilor Thorstad

Ordinance was read in its entirety.

Second Reading of Ordinance Bills

Motion to move Ordinance Bill No. 5 for 2023 to second reading Councilor Gourley, Seconded by Councilor Mahler.
Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Richards, Councilor Thorstad.

Ordinance No. 5 for 2023 was read by title only.

Motion to move Ordinance Bill No. 5 for 2023 to third and final reading by Councilor Mahler, seconded by Councilor Richards. Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Richards, Councilor Thorstad.

Third Reading of Ordinance Bills (Roll Call Vote Required)

a) Ordinance No. 1 for 2023 - Ordinance No. 1307 - Parking Zone Amendment Ordinance

Ordinance No. 1 for 2023 Amending Parking Zones was read by title only.

Motion to approve Ordinance No. 1 for 2023 - Ordinance No. 1307 - was made by President Pro Tem Mahler, Seconded by Councilor Richards.
Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Richards, Councilor Thorstad

b) Ordinance No. 2 for 2023 - Ordinance No. 1308 - Vehicle Camping Ordinance

Ordinance No. 2 for 2023 regarding vehicle camping was read by title only.

Motion to approve Ordinance No. 2 for 2023 - Ordinance 1308 - was made by President Pro Tem Mahler, Seconded by Councilor Richards.
Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Richards, Councilor Thorstad

c) Ordinance No. 3 for 2023 - Ordinance No. 1309 - RV Parking Ordinance Amendment

Ordinance No. 3 for 2023 was read by title only and amended under section 1 (A)(2) or tenants was added to "property owners."

Ordinance No. 3 for 2023 - Ordinance No. 1309 was read by title only.

Motion to approve Ordinance No. 3 for 2023 as amended was made by President Pro Tem Mahler, Seconded by Councilor Richards.
Voting Yea: Mayor Coleman, President Pro Tem Mahler, Councilor Trask, Councilor Gourley, Councilor Sanchez, Councilor Richards, Councilor Thorstad

Reports of Committees:

Ad Hoc Committee on Health

Councilor Gourley reported the Western University students are collecting data and reporting to the Community Health Committee before making a plan of action.

Councilor Gourley reported the FAC facility is open.

Reports of City Officials:

Mayor's Report

Mayor Coleman reported she received a tour of the FAC facility and is grateful for Sweet Home's Police Department and Public Works. Mayor Coleman specifically thanked CSO Sean Morgan, Public Works Superintendent Dominic Valloni, and the Ad Hoc Committee on Health. She also thanked Councilor Sanchez who volunteers on the FAC Board of Directors. Mayor Coleman appreciated the compassionately responsible approach. It was noted 80% of the clients have traumatic brain injuries and have very specific needs.

Mayor Coleman made the following committee assignments: Administration, Finance and Property Committee - Councilor Thorstad, Councilor Mahler, and Councilor Trask; Park and Tree Committee - Councilor Trask; Youth Advisory Council - Councilor Sanchez; Chamber of Commerce - Councilor Thorstad; Area Commission on Transportation - Councilor Sanchez; Council of Governments - Councilor Thorstad; Solid Waste Advisory Committee- Mayor Coleman; Ad Hoc Community Healthcare Committee - Councilor Gourley; School Board Committee - Mayor Coleman; Traffic Safety Committee - Councilor Richards; Library Board Committee - Councilor Richards; Art and Culture Committee - Councilor Gourley.

City Manager's Report

City Manager Young reported she attended graduation for three of our Police Officers.

The FAC facility is currently open and at capacity with 21 huts filled. There is an overflow area at the Police Station. The former City Hall has been cleaned up.

There was discussion to move the council training to Feb 23rd and 24th.

Community and Economic Development Director Blair Larsen gave an update on the Ameresco LED Street Light Conversion.

Department Director's Reports (2nd meeting of the Month)

Police Chief

a) Sweet Home Police Department Monthly Report

Chief Ogden announced several officers who have just completed graduation and one officer entering academy.

Chief Ogden thanked City Manager Young for attending.

City Attorney

No Report.

Council Business for Good of the Order

Mayor Coleman read a thank you letter to City Council and employees for their efforts in community safety.

Councilor Sanchez reported she will attend a lobby day tomorrow at Capital to learn more about SB445 which is funding for traffic safety devices.

Adjournment

The meeting adjourned at 9:09 PM.

_____

Mayor

ATTEST:

_____

City Manager – Ex Officio City Recorder

REQUEST FOR COUNCIL ACTION

Title:	Mahler WRF Interim Improvements Project - Final Design Task Order
Preferred Agenda:	February 14, 2023
Submitted By:	Trish Rice, Engineering Tech 2 Greg Springman, PWD
Reviewed By:	Kelcey Young, City Manager
Type of Action:	Resolution ___ Motion ____ Roll Call _X_ Other ___
Relevant Code/Policy:	N/A
Towards Council Goal:	1.1 Develop specific steps for implementation of the adopted infrastructure master plans.
Attachments:	Proposal for Engineering Services for Sweet Home WWTP Phase 1 Final Design and Bidding, and Phase 2 60% Final Design

Purpose of this RCA:

Staff is requesting Council authorization to accept West Yost Associates' proposal for the final phase of MWRF design services.

Background/Context:

The City contracted with West Yost Associates for Engineer of Record services in September 2020 based on a qualifications-based selection process. Projects are assigned to West Yost via task orders, which are reviewed and approved individually.

The critical factor throughout this project has been the June 30, 2023 spending deadline for the $7M state earmark. Staff approved Task Order 9, *"WWTP Phase 1 Final Design"* on September 28, 2021, for the not-to-exceed price of $1,137,477. With the execution of Task Order 9, the WWTP project was divided into Phase 1 construction and Phase 2 construction so that Phase 1 could bid as soon as possible to meet the earmark deadline. Phase 2 design was to begin after Phase 1 design finished.

On March 7, 2022 staff approved Amendment 1 to change the design scope to allow parallel design tracks for Phase 1 and Phase 2, to ensure that the phases would integrate properly. Amendment 1 allocated work to get Phase 1 to 60% design and Phase 2 to 30% design. Amendment 1 had no cost changes, although WY did advise staff to expect a future request for additional funds to proceed beyond Phase 1 60% design.

On April 26, 2022 Council approved Amendment 2 to add Phase 1 final design and bid services, and Phase 2 60% design, for another $2,290,858.00.

On August 23, 2022 Council approved Amendment 3 to add Phase 1 construction support services for $879,670.

Council approved to solicit bids for Phase 1 in September 2022. Staff received formal bids from three pre-qualified contractors. All bids submitted by the contractors exceeded 25% of the Engineer's estimate, requiring the City to not award the contract. Staff and West Yost then adjusted the project to merge Phases 1 and 2 back together, and created a much smaller Interim Improvement Project (IIP) which includes the pre-purchase of owner-supplied dewatering equipment, purchase long-lead electrical equipment, and installation of the dewatering equipment and a sludge blend tank. On November 8, 2022 Council directed staff to proceed with the IIP. West Yost has completed final design and the IIP is out to bid. The existing Amendment 3 for Phase 1 construction services will be used to fund the construction services for the IIP which are expected to total approx. $50-60k.

West Yost has now submitted their proposal for final design for a not-to-exceed price of $1,560,873, which will carry the major phase of the MWRF Improvements Project from 60% through final design, including design of the outfall replacement. The design of all the treatment processes will be complete by June 30, 2023 and will be funded by the $7M state earmark resulting in $1,443,439.00 spend this fiscal year. The outfall design will extend into next fiscal year and the $117,434 for that work will be funded by ARPA.

Staff is requesting Council authorization to execute this task order to maintain the current design pace. The project team has developed a high level of synergy and momentum, and the design must continue to proceed at an incredible pace to meet the strict schedule requirements for spending the state earmark.

This proposal does not include bid support services. Looking ahead, additional funds will be required for bid support services. Additional funds will also be required to increase the scope of the construction services, since it only covered Phase 1 and the phases have now been merged.

The Challenge/Problem:

Completing design and construction in a timely and fiscally responsible manner, to comply with funding deadlines and regulatory requirements, within City budget restraints.

Stakeholders:

- *City Residents*. Residents are the customers who deserve good service with the highest return on their taxes and fees that we can provide, and who trust the City to maintain their infrastructure systems at a high level of service.
- *Council Members*. Council members are the voice of the citizens we serve. Each member of this group is interested in providing the best service possible at the lowest possible cost. They must balance leadership with representation.
- *Public Works Department Staff.* This project will greatly improve the operability of the WWTP which is currently undersized and beyond its serviceable lifespan. Staff spends significant time fixing broken down equipment and fighting with system inefficiencies.
- *Management Team*. Comprised of five department heads, each with a responsibility to the citizens and Mayor to run their day-to-day operations as efficiently as possible.
- *Oregon DEQ*. The WWTP upgrade project is required to comply with DEQ regulations.

Issues and Financial Impacts:

The design must continue on schedule to meet the $7M earmark spending deadline.

West Yost has now submitted their proposal for final design for a not-to-exceed price of $1,560,873, which will carry the major phase of the MWRF Improvements Project from 60% through final design, including design of the outfall replacement. The design of all the treatment processes will be complete by June 30, 2023 and will be funded by the $7M state earmark resulting in $1,443,439.00 spend this fiscal year. The outfall design will extend into next fiscal year and the $117,434 for that work will be funded by ARPA.

This proposal does not include bid support services. Looking ahead, additional funds will be required for bid support services. Additional funds will also be required to increase the scope of the construction services, since it only covered Phase 1 and the phases have now been merged.

Elements of a Stable Solution:

Keep the design on schedule to meet the $7M earmark spending deadline.

Options:

1. *Move to authorize staff to execute Task Order 9 Amendment 4.* This will keep the project on schedule to meet the $7M spending deadline by June 2023.
2. *Do nothing.* Not recommended.
3. *Request more information or give staff other direction.*

Recommendation:

Staff recommends Option 1, *Move to authorize staff to execute Task Order 9 Amendment 4.* This will keep the project on schedule to meet the $7M spending deadline by June 2023.

WEST YOST
Water. Engineered.

5 Centerpointe Drive
Suite 130
Lake Oswego OR 97035

503.451.4500 phone
530.756.5991 fax
westyost.com

January 19, 2023

SENT VIA: EMAIL

Mr. Greg Springman
Public Works Director
City of Sweet Home
1400 24th Avenue
Sweet Home, OR 97386

SUBJECT: Proposal for Engineering Services for Sweet Home Mahler Water Reclamation Facility Improvements Project Final Design

Dear Mr. Springman:

This Letter Proposal summarizes West Yost's Project Team, Scope, Budget and Schedule for completing Final Design for the City of Sweet Home (City) Mahler Water Reclamation Facility (MWRF) Improvements Project.

The MWRF Improvement Project was planned to be completed in two phases: Phase 1 was bid by the City and not awarded. As a result, the City is proceeding with a smaller near-term project that includes procurement of new dewatering equipment and construction of a waste activated sludge (WAS) holding tank that will be used as part of the larger MWRF improvements. For simplicity and to avoid confusing project terminology, the Phase 1 and Phase 2 designations are no longer being used for the Project's names and we are now referring to two separate Projects:

> **MWRF Interim Improvements Project (IIP):** small, near-term improvements project targeting expenditure of the City's $7M in grant funding from the Oregon Legislature that expires on June 30, 2023.
>
> **MWRF Improvements Project:** a larger, single-phase project to complete the remaining required upgrades of the City's MWRF.

PROJECT TEAM

West Yost's project team will continue with the same staff currently working on the Project. Key staff include:

Team Member	Role
West Yost	
Corie Moolenkamp	Principal-in-Charge – supporting the City and Project Team
Preston Van Meter	Project Manager and primary point of contact
Brooke Barry	Deputy Project Manager, Civil Design Lead/alternate point of contact
Jane Costello	Liquids Stream Design Manager
Bill Schilling	Liquids Stream Design Manager
Hannah Carpenter	Solids Stream Design Manager
Walt Meyer	QA/QC and Technical Advisor
Tim Banyai	QA/QC and Technical Advisor
Greg Chung	QA/QC and Technical Advisor

Sub-Consultants	
Ace Engineers	Structural Design Lead
Strongwork Architecture	Architectural Design Lead
Interface Engineering	Building A MEP and Overall HVAC Design Lead
Landis Consulting	Electrical, Instrumentation and Controls (EI&C) Design Lead
The Automation Group	Controls and Automation Lead and City Integrator-of-Record
Cadworks	Mechanical CAD Design and 3D Modeling

SCOPE OF SERVICES

West Yost's proposed Scope of Services for City's WWTP Improvements Project is included as Attachment A. The Scope of Services includes the following tasks:

Task 1. Project Management

Task 2. Additional Project Planning and Coordination Activities

Task 3. MWRF Improvements Project Final Design

The construction drawing index for final design documents used for budgeting purposes is included as Scope of Services, Exhibit 1.

Bidding services are not included in this contract amendment and will be contracted separately as part of the Construction Services for the MWRF Improvements Project.

PROJECT BUDGET

West Yost's proposed level of effort and budget is summarized in Table 1 below and Attachment B. West Yost will perform the Scope of Services with a not-to-exceed budget of **$1,560,873**. Any additional services not included in this Scope of Services will be performed only after receiving written authorization and a corresponding budget augmentation.

Table 1. Project Budget

Task	FY 23 Budget, dollars	FY 24 Budget, dollars
Task 1. Project Management	40,284	4,500
Task 2. Additional Project Planning and Coordination Activities	100,496	50,497
Task 3. MWRF Improvements Project Final Design	1,302,659	62,437
Total	**$1,443,439**	**$117,434**

SCHEDULE

West Yost's effort estimate is based on the following completion schedule:

Complete MWRF Improvements Final Design: June 30, 2023

Complete South Santiam River Outfall Final Design: September 30, 2023

An updated project schedule will be included in the Preliminary Engineering Report (PER) currently being finalized by West Yost.

An updated project schedule will be included in the Preliminary Engineering Report (PER) currently being finalized by West Yost.

CONTRACTUAL TERMS AND CONDITIONS

West Yost will complete the Project in accordance with the terms and conditions of our current City Engineer-of-Record contract utilizing West Yost's current 2023 rates as summarized in Attachment C. Billing Rates for Corie Moolenkamp and Preston Van Meter are reduced and proposed as follows:

Preston Van Meter Special Billing Rate:	$273/hour
Corie Moolenkamp Special Billing Rate:	$288/hour

If West Yost's proposal is accepted by the City, a Task Order Agreement with signature blocks will be prepared for all parties to fully execute the contract. To simplify the process of managing and tracking different budgets associated with existing versus new task orders, West Yost proposes setting up this budget augmentation as a new task order utilizing our current billing rates with special rates for staff noted above.

Thank you for providing West Yost the opportunity to be of continued service to the City. We look forward to working with you on this important Project. Please call Preston at 503.784.9536 if you have any questions or require additional information.

Sincerely,
WEST YOST

Greg Chung, PE
Vice President
PE #91820

Preston Van Meter, PE
Principal Engineer
PE #51615

Attachment A

Scope of Services

West Yost proposes to provide the following Scope of Services to complete final design and prepare final Contract Documents (Final CDs) for the MWRF Improvements Project. This scope also includes design and permitting for replacement of the South Santiam River outfall. This scope will be an augmentation of tasks and budget for the current MWRF Improvements Project. Therefore, tasks and sub-tasks may change slightly when these additional tasks are added to the current work breakdown structure for the MWRF Improvements Project.

Task 1. Project Management

Project management includes coordination of West Yost's internal team and subconsultants, quality assurance and quality control (QA/QC) activities, and preparation of monthly project updates and invoices.

Task 1.01. Monthly Project Status Reports and Invoices

Prepare monthly project updates, including a summary of project status, monthly invoice for services performed, earned value analysis (EVA) assessing project completion versus budget utilized, key upcoming project milestones, and any anticipated issues that may impact project budget or schedule. This task includes the preparation of monthly City Council project updates.

Task 1.02. Team Coordination Activities

West Yost will conduct monthly project check-in conference calls with City staff to review and discuss design issues, track project budget and schedule status, identify key coordination items (e.g. permitting) and other elements pertinent to the Project. For budgeting purposes, six additional 1-hour calls are budgeted to be attended by West Yost's Project Manager, Deputy Project Manager and Design Managers.

Task 1.03. City Council Meetings

West Yost's Project Manager will attend two (2) City Council meetings to support City staff with presentations to City Council. Presentations will be developed for each meeting attended by West Yost staff.

Task 1 Assumptions

- The project duration is anticipated to begin in January and continue through September 2023; therefore, ten (10) monthly project progress reports and invoices are budgeted.
- Action items from bi-weekly project check-in conference calls will be sent to attendees via email.

Task 1 Deliverables

- West Yost will provide one electronic (PDF) copy of monthly progress reports with invoices.
- West Yost will provide one electronic (PDF) copy of monthly City Council updates using the standard template currently being utilized.

Task 2. Additional Project Planning and Coordination Activities

Scope of Services for additional project planning, permitting and coordination activities related to the new South Santiam River outfall and updating the General Contractor Pre-Qualification to solicit other interested General Contractors prior to bidding the MWRF Improvements Project will be completed in this task.

Task 2.01. New South Santiam River Outfall Mixing Zone Study

West Yost's team will use the preliminary outfall design developed previously to complete a mixing zone study for the new South Santiam River outfall. The Mixing Zone study will be completed in accordance with DEQ Level 2 Mixing Zone Study Requirements. The Mixing Zone Study will initially be developed using existing river bathymetry (elevation) data collected during the 2017 outfall mixing zone study. The DEQ-preferred mixing zone modeling software CORMIX© will be used.

The Mixing Zone Study will be submitted to DEQ for review and approval and will also be used as part of the environmental permitting process for the project. If validation testing is required by DEQ following installation of the new outfall, a dye tracer study will be scoped separately as a part of construction services.

Task 2.02. South Santiam River Bathymetry and Mixing Zone Model Confirmation

River bathymetry (elevation) data will be collected during low river flows in August 2023 to confirm the mixing zone modeling conducted in Task 2.01. The CORMIX© mixing zone model will be updated, and an Amendment to the Mixing Zone Study will be issued, if required.

Task 2.03. New South Santiam River Outfall Permitting Support Services

West Yost's team will provide the following water quality assessment required for the new outfall using dilution factors developed as part of the Mixing Zone Study:

- Obtain and review existing effluent data, including organics and metals (metals, organics);
- Evaluate organics and metals for anticipated effluent quality following plant upgrades;
- Review existing and new South Santiam River bathymetry data;
- Conduct aquatic life and human health Reasonable Potential Analysis (RPA) for organics and metals using the DEQ RPA spreadsheet;
- Conduct RPA for ammonia based on anticipated effluent concentrations following plant upgrades;
- Conduct assessment for copper using the DEQ-approved biotic ligand model (BLM);
- Conduct thermal load assessment with Willamette Temperature TMDL wasteload allocations;
- Prepare a summary water quality assessment technical memorandum; and
- Meet and coordinate with DEQ as required.

Task 2.04. Re-Issue/Update General Contractor Pre-Qualification

West Yost will reissue the City's General Contractor Pre-Qualification Documents to seek additional Contractors interested in participating in the bidding process for the MWRF Improvements Project. Pre-qualified Contractor's from the City's previous Pre-Qualification Process could be exempted from re-submitting the full Qualifications information, but should, at a minimum, re-submit a statement regarding available bonding capacity due to the increased estimated cost of the Project. West Yost will support the City in reviewing General Contractor submittals and prepare a memorandum summarizing the pre-qualified General Contractors for distribution by City staff.

Task 2 Assumptions

- CORMIX© modeling will initially be completed using 2017 South Santiam River bathymetry data and preliminary design to facilitate completion of design and permitting.
- Detailed South Santiam River bathymetry data will be collected in Summer 2023 (August) and the CORMIX© model and dilution values will be confirmed for the planned new outfall location.
- Copper BLM evaluations will use a simplified approach based on regional default values and estimated effluent concentrations.
- Documents prepared previously for General Contractor Pre-Qualification will be used for solicitation to pre-qualify additional Contractors.

Task 2 Deliverables

- West Yost will prepare one (1) electronic (PDF) copy of meeting agendas and minutes from DEQ and other regulatory meetings.
- West Yost will prepare one (1) electronic (PDF) copy of the draft MWRF South Santiam River Outfall Mixing Zone Study.
- West Yost will provide three (3) hard copies and one (1) electronic (PDF) copy of the Final South Santiam River Outfall Mixing Zone Study.
- West Yost will provide one (1) electronic (PDF) copy of the draft and final MWRF South Santiam River Outfall Mixing Zone Study Amendment incorporating any required updates associated with river bathymetry data.
- West Yost will provide one (1) electronic (PDF) copy of the draft and final MWRF South Santiam River Water Quality Assessment.
- West Yost will provide one (1) electronic (PDF) copy of the draft and final General Contractor Pre-qualification RFP and Pre-qualified Contractor's list for distribution by City staff.

Task 3 MWRF Improvements Project Final Design

Task 3 will carry the current Phase 1 60% design through completion and development of final Contract Documents for bidding. Bidding services will be provided under a separate task order.

Task 3.01. MWRF Improvements Project 90% Final Design

Complete 90% Design and prepare the MWRF Improvements 90% Design Submittal include drawings as summarized in Scope of Services Exhibit 1, specifications including Division 0 and 1 "front end" specifications, updated Engineer's Opinion of Probable Construction Cost (OPCC) and updated project schedule.

Task 3.02. MWRF Improvements 90% Final Design Workshop

Conduct an 8-hour workshop with City staff to review the MWRF Improvements Phase 1 90% Final Design Submittal. For planning purposes, the workshop will be conducted in two 4-hour blocks over two days. All key West Yost team members and sub-consultants will attend the workshop either in-person or via Teams.

Task 3.03. Permitting Reviews and Coordination

Submit the Phase 1 90% Final Design to DEQ, USDA, City Building Official and Linn County (electrical) for review. Lead agency meetings as required to obtain regulatory and funding agency approvals to proceed. This task assumes one (1) meeting with USDA, one (1) meeting with Oregon DEQ and one (1) meeting with the City's Building Official.

Task 3.04. Prepare Final Contract Documents

Incorporate review comments and prepare Final Phase 1 Contract Documents (Final CDs) for bidding. West Yost will prepare Final Contract Documents for bidding including construction drawings noted on the Drawing Sheet List (as modified during final design), specifications, updated Engineer's OPCC and Final Project Schedule.

Task 3.05. South Santiam River Outfall Final Contract Documents

Prepare final contract documents for the new MWRF South Santiam River Outfall using river bathymetry data collected during summer low flows in August 2023. It is anticipated the in-outfall replacement work will be completed on a separate contract from the larger MWRF Improvements project due to the nature of the project work (in-water) and timing of the river data collection. The Contract Documents are anticipated to include three General Drawings, six Civil Drawings, two Mechanical Drawings and two Structural Drawings. The design will be based on the preliminary design developed previously and will include a Draft Final Contract Documents submittal for City review.

Task 3 Assumptions

- No additional topographical surveying, hazardous materials survey or environmental documentation are anticipated to be required as part of the project.
- No services associated with hazardous materials removal or cultural artifacts recovery and monitoring are included in West Yost's Scope of Services.
- Deferred submittals during construction will be used for design-build of the following building systems: (1) Fire Detection and Alarm Systems and (2) Building Automation, Energy Management and Temperature Control Systems.
- Additional deferred submittals will include seismic and anchorage structural calculations for all major systems and equipment. Additional structural deferred submittals may be identified as the design is finalized. All deferred submittals will be listed on the Cover Sheet for the final construction drawings.
- Drawings will be developed for printing and readability based on 11x17 half-size reductions.
- CAD drawings will be developed using the following platforms: (1) Buildings and Structures: AutoCAD Plant 3D and Revit, (2) Civil/Site Work and Yard Piping: AutoCAD Civil 3D and (3) Electrical and Instrumentation: AutoCAD.
- Specifications shall be developed in the Construction Specifications Institute (CSI) 6-digit format. Division 0 and 1 specifications will be based on the MWRF Improvements Phase 1 contract documents developed previously and reviewed by the City Attorney.
- Budgeted hours for the 90% Final Design Review Workshop include time for preparation and team coordination following the workshop.
- Printing of Final CDs for Bidders is not included in West Yost's budget. It is anticipated copies of Final CDs will be issued to Bidders electrically or through a 3rd party printing company.
- Permit reviews and coordination assume that one (1) round of comment/response with permitting agency will be sufficient and that comments from permitting entity will be consolidated into one comment set.
- Building and electrical permits will be pulled by the General Contractor and fees paid by the City of Sweet Home.
- Construction services to be provided by West Yost and sub-consultants beyond Bidding Services will be contracted separately.

Task 3 Deliverables

- West Yost will provide three (3) hard copies and one (1) electronic (PDF) copy of the WWTP Phase 1 90% Design Submittal.
- West Yost will provide five (5) hard copies and one (1) electronic (PDF) copy of the WWTP Final Contract Documents.
- West Yost will provide (1) one electronic (PDF) copy of the agenda and minutes from all Final Design meetings and workshops.

Exhibit 1

Phase 1 Sheet List

Table 1 -1. Sheet List Summary by Discipline	
Sheet List Title	Number of Sheets:
General	9
Civil	36
Architectural	42
Structural	89
Mechanical	80
Plumbing	11
HVAC	10
Building Electrical	11
Technology	3
Process & Instrumentation Diagrams	45
Electrical	168
Instrumentation & Control	114
Total	**618**

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
GENERAL	
G-000	COVER SHEET
G-001	DRAWING INDEX
G-002	GENERAL NOTES
G-003	SYMBOLS
G-004	ABBREVIATIONS
G-005	DESIGN CRITERIA
G-006	LIQUIDS PROCESS FLOW DIAGRAM
G-007	SOLIDS PROCESS FLOW DIAGRAM
G-008	HYDRAULIC PROFILE
CIVIL	
C-001	CIVIL DETAILS 1
C-002	CIVIL DETAILS 2
C-003	CIVIL DETAILS 3
C-004	CIVIL DETAILS 4
C-005	CIVIL DETAILS 5
C-006	CIVIL DETAILS 6
C-007	BATHROOM RELOCATION DETAILS
C-010	EXISTING CONDITIONS PLAN
C-011	EXISTING UTILITIES PLAN
C-020	SITE DEMOLITION & REHAB OVERVIEW PLAN
C-021	UTILITY DEMOLITION PLAN
C-022	BACKWASH STORAGE/IMHOFF TANK DEMOLITION
C-023	EXISTING IPS PARTIAL DEMOLITION & REHABILITATION
C-024	EX. CHLORINE CONTACT BASIN (CCB) PARTIAL DEMOLITION & REHABILITATION PLAN
C-025	EXISTING (CCB) PARTIAL DEMOLITION & REHABILITATION PLAN SECTIONS
C-026	EXISTING AERATION BASIN PARTIAL DEMOLITION & REHABILITATION PLAN
C-027	EXISTING AERATION BASIN PARTIAL DEMOLITION & REHABILITATION SECTIONS
C-030	OVERALL SITE PLAN, STRUCTURE COORDINATES, STAGING AND ACCESS
C-040	EROSION CONTROL NOTES
C-041	EROSTION CONTROL DETAILS
C-042	EROSTION CONTROL PLAN
C-050	OVERALL GRADING PLAN
C-051	MAIN ELECTRICAL/BLOWER BUILDING GRADING PLAN
C-052	WALL PROFILES

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
C-060	YARD PIPING PLAN 1
C-061	YARD PIPING PLAN 2
C-062	YARD PIPING PLAN 3
C-070	PIPE PROFILES - 1
C-071	PIPE PROFILES - 2
C-072	PIPE PROFILES - 3
C-073	PIPE PROFILES - 4
C-074	PIPE PROFILES - 5
C-075	PIPE PROFILES - 6
C-076	PIPE PROFILES - 7
C-077	PIPE PROFILES - 8
C-078	PIPE PROFILES - 9
C-079	PIPE PROFILES - 10
C-080	PIPE PROFILES - 11
C-081	PIPE PROFILES - 12
ARCHITECTURAL	
A-001	GENERAL ARCHITETURAL LEGEND AND CODE INFORMATION
A-002	ARCHITECTURAL CODE INFORMATION AND PLANS
A-003	ARCHITECTURAL CODE SITE PLAN
A-004	ARCHITECTURAL DOOR TYPES SCHEDULES
A-005	ARCHITECTURAL WINDOW TYPES AND SCHEDULES AND FINISH SCHEDULES
A-006	GENERAL ARCHITECTURAL DETAILS - VERTICAL ASSEMBLIES
A-007	GENERAL ARCHITECTURAL DETAILS - HORIZONTAL ASSEMBLIES
A-008	GENERAL ARCHITECTURAL DETAILS - DOOR DETAILS - 1
A-009	GENERAL ARCHITECTURAL DETAILS - DOOR DETAILS - 2
A-010	GENERAL ARCHITECTURAL DETAILS - OVERHEAD DOOR DETAILS
A-011	GENERAL ARCHITECTURAL DETAILS - WINDOW DETAILS - 1
A-012	GENERAL ARCHITECTURAL DETAILS - WINDOW AND HATCH DETAILS
A-013	GENERAL ARCHITECTURAL DETAILS - LOUVER DETAILS
A-014	GENERAL ARCHITECTURAL DETAILS - MISC BUILDING DETAILS
A-015	GENERAL ARCHITECTURAL DETAILS - MISC BUILDING DETAILS
A-016	GENERAL ARCHITECTURAL DETAILS - MISC BUILDING DETAILS
A-017	GENERAL ARCHITECTURAL DETAILS - MISC BUILDING DETAILS
A-018	GENERAL ARCHITECTURAL DETAILS - MISC BUILDING DETAILS
A-019	GENERAL ARCHITECTURAL DETAILS - OPENINGS AND MISC BUILDING DETAILS

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
A-150	SOUTH ELECTRICAL BUILDING PLAN ELEVATIONS & SECTIONS
A-200	BUILDING A - FIRST FLOOR PLAN
A-201	BUILDING A - SECOND FLOOR PLAN
A-202	BUILDING A - ADMINISTRTAION AREA - ENLARGED PLAN 1
A-203	BUILDING A - ADMINISTRTAION AREA - ENLARGED PLAN 2
A-204	BUILDING A - BUILDING ELEVATION 1
A-205	BUILDING A - BUILDING ELEVATION 2
A-206	BUILDING A - REFLECTED CEILING PLANS
A-207	BUILDING A - ROOF PLAN
A-208	BUILDING A - BUILDING SECTIONS
A-209	BUILDING A - WALL SECTIONS
A-210	BUILDING A - WALL SECTIONS
A-211	BUILDING A - INTERIOR ELEVATIONS
A-400	MAIN ELECTRICAL & BLOWER BUILDING ELEVATIONS AND SECTIONS
A-401	MAIN ELECTRICAL & BLOWER BUILDING FLOOR, ROOF, AND RCP PLAN
A-402	MAIN ELECTRICAL & BLOWER WALL SECTIONS
A-500	TERTIARY BUILDING FLOOR, ROOF, AND RCP PLAN
A-501	TERTIARY BUILDING ELEVATIONS AND SECTIONS
A-502	TERTIARY BUILDING WALL SECTIONS
A-503	TERTIARY BUILDING – WALL SECTIONS
A-610	SOLIDS BUILDING FLOOR, ROOF, AND RCP PLAN
A-611	SOLIDS BUILDING ELEVATIONS AND SECTIONS
A-612	SOLIDS BUILDING WALL SECTIONS
STRUCTURAL	
S-001	GENERAL STRUCTURAL NOTES STRUCTURAL ABBREVIATIONS
S-002	SPECIAL INSPECTIONS NAD STRUCTURAL NOTES
S-003	STRUCTURAL MATERIALS NOTES
S-004	STRUCTURAL MATERIALS NOTES CONTINUED
S-005	TYPICAL CONCRETE JOINT DETAILS
S-006	TYPICAL CONCRTE REINFORCING DETAILS
S-007	TYPICAL CONCRTE BASE DETAILS
S-008	TYPICAL MASONRY DETAILS
S-009	TYPICAL MASONRY DETAILS
S-010	TYPICAL GRATING DETAILS
S-011	TYPICAL METAL DETAILS

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
S-012	TYPICAL RAILING DETAILS
S-110	INFLUENT PUMP STATION - PLAN & SECTIONS
S-111	INFLUENT PUMP STATION - TRANSVERSE SECTION
S-112	INFLUENT PUMP STATION - TRANSVERSE SECTION
S-113	INFLUENT PUMP STATION SECTIONS & DETAILS
S-114	EXISTING INFLURNT SEWER DIVERSION STRUCTURES
S-130	RECYCLE DRAIN PUMP STATION PLANS & SECTIONS
S-131	RECYCLE DRAIN PUMP STATION TOP PLAN
S-132	RECYCLE DRAIN PUMP STATION SECTIONS
S-133	RECYCLE DRAIN PUMP STATION SECTIONS & DETAILS
S-200	BUILDING A FOUNDATION PLAN AND SECOND FLOOR FRAMING PLAN
S-201	BUILDING A FOUNDATION DETAILS
S-202	BUILDING A FRAMING DETAILS
S-230	RAW SEWAGE SCREENING & GRIT REMOVAL FOUNDATION PLANS
S-231	RAW SEWAGE SCREENING & GRIT REMOVAL TOP SLAB & GRATING PLANS
S-232	RAW SEWAGE SCREENING SECTIONS
S-233	RAW SEWAGE SCREENING SECTIONS
S-234	RAW SEWAGE SCREENING BYPASS CHANNEL SECTION
S-235	GRIT REMOVAL SECTION
S-236	RAW SEWAGE SCREENING & GRIT REMOVAL SECTIONS
S-237	RAW SEWAGE SCREENING CHANNEL SECTION
S-238	RAW SEWAGE SCREENING & GRIT CHAMBER CHANNEL SECTION
S-239	GRIT REMOVAL INLET/OUTLET CHANNEL SECTION
S-310	PRIMARY CLARIFIER LOWER FOUNDATION PLANS
S-311	PRIMARY CLARIFIER UPPER FOUNDATION PLANS & TOP SLAB PLAN
S-312	PRIMARY CLARIFIER OVERALL SECTION & INLET CHANNEL SECTIONS
S-313	PRIMARY CLARIFIER LONGITUDINAL SECTION
S-314	PRIMARY CLARIFIER LONGITUDINAL SECTION
S-315	PRIMARY CLARIFIER TRAVERSE SECTION
S-316	PRIMARY CLARIFIER INLET CHANNEL SECTIONS
S-317	PRIMARY EFFLUENT CONTROL STRUCTURE SECTIONS
S-318	PRIMARY EFFLUENT CONTROL STRUCTURE & PRIMARY SCUM WELL SECTIONS
S-320	HEADWORKS ODOR CONTROL FOUNDATION PLAN & SECTION
S-400	MAIN ELECTRICAL & BLOWER BUILDING - FOUNDATION & FRAMING PLANS
S-401	MAIN ELECTRICAL & BLOWER BUILDING - SECTIONS & DETAILS

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
S-402	GENERATOR FOUNDATION PLAN & SECTION
S-410	AERATION BASIN 1 & 2 FOUNDATION PLAN
S-411	AERATION BASIN 1 & 2 TOP PLAN
S-412	AERATION BASIN 1 & 2 SECTIONS
S-413	AERATION BASIN 1 & 2 MCLS SECTION
S-414	MCLS OUTLET SECTIONS
S-415	EXISTING AERATION BASIN SECTIONS AND DETAILS
S-416	EXISTING AERATION BASIN SECTIONS AND DETAILS
S-420	AERATION BASIN 3 FOUNDATION PLAN
S-421	AERATION BASIN 3 TOP PLAN & SECTION
S-422	AERATION BASIN 3 SECTIONS & DETAILS
S-423	AERATION BASIN 3 SECTIONS & DETAILS
S-424	AERATION BASIN 3 SECTIONS & DETAILS
S-425	AERATION BASIN 3 SECTIONS & DETAILS
S-440	SC 60 RAS/WAS PUMP STATION SECTIONS & DETAILS
S-441	SC 60 RAS/WAS PUMP STATION FOUNDATION & TOP SLAB PLANS
S-450	SC 90 FOUNDATION PLAN AND SECTION
S-451	SC 90 TOP PLAN AND SECTION
S-452	SC 90 RAS/WAS PUMP STATION STATIONS
S-453	SC 90 RAS PUMP STATION SECTIONS
S-454	SC 90 WAS PUMP STATION STATIONS
S-455	SC 90 WAS PUMP STATION SECTIONS
S-500	UV, UTILITY WATER, FLUME FOUNDATION PLAN
S-501	TERTIARY BUILIDNG FOUNDATION PLAN
S-502	TERTIARY BUILDING ROOF FRAMING PLAN
S-503	TERTIARY BUILDING MASONRY SHEAR WALL ELEVATIONS
S-504	TERTIARY BUILDING SECTIONS & DETAILS
S-505	TERTIARY BUILDING SECTIONS & DETAILS
S-520	UV SECTIONS & DETAILS
S-530	FLUME SECTIONS & DETAILS
S-510	FILTERS FOUNDATION PLANS
S-511	FILTERS FOUNDATION AND TOP PLANS
S-512	FILTERS LONGITUDINAL SECTION
S-513	FILTERS TRAVERSE SECTION
S-514	FILTERS DRY PIT TRANSVERSE SECTION

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
S-610	SOLIDS BUILDING FOUNDATION PLAN
S-611	SOLIDS BUILDING ROOF FRAMING PLAN
S-612	SOLIDS BUILDING MASONRY SHEAR WALL ELEVATIONS
S-613	SOLIDS BUILDING SECTIONS & DETAILS
S-640	PRIMARY DIGESTER UPPER FOUNDATION PLAN
S-641	PRIMARY DIGESTER TOP PLAN
S-642	PRIMARY DIGESTER FOUNDATION PLAN
S-643	PRIMARY DIGESTER SECTION
MECHANICAL	
M-001	MECHANICAL DETAILS 1
M-002	MECHANICAL DETAILS 2
M-003	MECHANICAL DETAILS 3
M-004	MECHANICAL DETAILS 4
M-110	INFLUENT PUMP STATION ISOMETRIC VIEW
M-111	INFLUENT PUMP STATION PLANS
M-112	INFLUENT PUMP STATION SECTION
M-113	INFLUENT PUMP STATION SECTION & DETAIL
M-114	INFLUENT PUMP STATION SECTION & DETAIL 3
M-130	RECYCLE DRAIN PUMP STATION ISOMETRIC VIEW
M-131	RECYCLE DRAIN PUMP STATION PLAN
M-132	RECYCLE DRAIN PUMP STATION SECTIONS & DETAIL
M-230	RAW SEWAGE SCREENING ISOMETRIC VIEW
M-231	RAW SEWAGE SCREENING TOP PLANS
M-232	RAW SEWAGE SCREENING BOTTOM PLAN
M-233	RAW SEWAGE SCREENING SECTIONS 1
M-234	RAW SEWAGE SCREENING SECTIONS 2
M-240	GRIT REMOVAL ISOMETERIC VIEW
M-241	GRIT REMOVAL PLAN & SECTION
M-242	GRIT REMOVAL SECTIONS
M-250	SOLIDS DEWATERING ISOMETRIC VIEW
M-251	SOLIDS DEWATERING PLAN
M-252	SOLIDS DEWATERING SECTION 1
M-253	SOLIDS DEWATERING SECTION 2
M-254	SOLIDS DEWATERING SECTION 3
M-310	PRIMARY CLARIFIERS ISOMETRIC VIEW

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
M-311	PRIMARY CLARIFIERS TOP PLAN
M-312	PRIMARY CLARIFIERS BOTTOM PLAN
M-313	PRIMARY CLARIFIERS SECTIONS
M-314	PRIMARY CLARIFIERS ENLARGED PLAN 1
M-315	PRIMARY CLARIFIERS ENLARGED PLAN 2
M-316	PRIMARY SCUM PUMP STATION TOP & BOTTOM PLAN, SECTIONS
M-320	ODOR CONTROL MECHANICAL PLANS, SECTION & DETAIL
M-321	ODOR CONTROL MECHANICAL PLANS, SECTION & DETAIL
M-330	SODIUM HYDROXIDE STORAGE & METERING MECHANICAL PLANS & SECTION
M-400	BLOWER ROOM ISOMETRIC VIEW
M-401	BLOWER ROOM & AERATION PIPING PLAN
M-402	BLOWER ROOM & AERATION PIPING SECTION
M-410	AERATION BASIN (AB) 1 & 2 ISOMETRIC VIEW
M-411	AERATION BASIN 1 & 2 LOWER MECHANICAL PLAN
M-412	AERATION BASIN 1 & 2 UPPER MECHANCIAL PLAN
M-413	AERATION BASIN 1 & 2 SECTIONS
M-415	AERATION BASIN 3 ISOMETRIC VIEW
M-416	AERATION BASIN 3 LOWER MECHANICAL PLAN
M-417	AERATION BASIN 3 UPPER MECHANICAL VIEW
M-418	AERATION BASIN 3 SECTION 1
M-419	AERATION BASIN 3 SECTIONS & DETAILS 2
M-420	AERATION BASIN 3 SECTION 3
M-430	MLCS ISOMETRIC VIEW
M-431	MLCS TOP AND BOTTOM PLAN
M-432	MLCS SECTIONS
M-440	SC 60 RAS/WAS PUMP STATION ISOMETRIC VIEW
M-441	SC60 RAS/WAS PUMP STATION TOP PLAN
M-442	SC60 RAS/WAS PUMP STATION BOTTOM PLAN
M-443	SC60 RAS/WAS PUMP STATION SECTIONS 1
M-444	SC 60 RAS/WAS PUMP STATION SECTIONS 2
M-450	SC90 ISOMETRIC VIEW
M-451	SC90 PLANS
M-452	SC90 SECTIONS
M-453	SC90 DETAILS
M-454	SC 90 RAS PUMP STATION ISOMETRIC VIEW

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
M-455	SC 90 RAS PUMP STATION PLANS
M-456	SC 90 RAS PUMP STATION SECTIONS & DETAILS
M-457	SC 90 WAS PUMP STATION ISOMETRIC VIEW
M-458	SC 90 WAS PUMP STATION PLANS
M-459	SC 90 WAS PUMP STATION SECTIONS
M-500	TERTIARY AREA PLAN
M-511	TERTIARY FILTER PLAN
M-512	TERTIARY FILTERS SECTIONS
M-522	UV DISINFECTION PLAN
M-523	UV DISINFECTION SECTION
M-531	UW PUMP STATION & EFFLUENT FLOW MONITORING SECTIONS
M-533	UW CHLORINATION PLAN & SECTION
M-600	SLUDGE BLEND TANK & MIXING SYSTEM PLAN, SECTIONS AND DETAILS
M-610	SOLIDS BUILDING PLAN
M-630	PRIMARY DIGESTER ISOMETRIC VIEW
M-631	PRIMARY DIGESTER TOP PLAN
M-632	PRIMARY DIGESTER BOTTOM PLAN
M-633	PRIMARY DIGESTER SECTIONS
M-640	DIGESTED SLUDGE HOLDING TANK & MIXING SYSTEM PLAN SECTIONS & DETAILS
PLUMBING	
P-001	PLUMBING SYMBOL LIST AND GENERAL NOTES
P-002	PLUMBING SCHEDULES
P-003	PLUMBING DETAILS
P-004	PLUMBING DETAILS
P-005	GAS RISER DIAGRAM
P-200	BUILDING A - UNDERGROUND PLAN
P-201	BUILDING A - PLUMBING FLOOR PLAN
P-202	BUILDING A - PLUMBING SECOND FLOOR PLAN
P-203	BUILDING A - ENLARGED PLAN
P-500	MAIN ELECTRICAL & BLOWER BUILDING PLUMBING PLANS
P-610	SOLIDS ELECTRICAL & BLOWER BUILDING PLUMBING PLANS
HVAC	
H-001	HVAC SYMBOL LIST AND GENERAL NOTES
H-002	HVAC SCHEDULES
H-003	HVAC SCHEDULES

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
H-004	HVAC DETAILS
H-100	SOUTH ELECTRCIAL BUILDNG HVAC FLOOR PLAN
H-200	BUILDING A - FLOOR PLAN
H-201	BUILDING A - SECOND FLOOR PLAN
H-400	MAIN ELECTRICAL & BLOWER BUILDING HVAC FLOOR PLAN
H-500	TERTIARY BUILDING FLOOR AND ROOF HVAC PLANS
H-610	SOLIDS BUILIDNG FLOOR AND ROOF HVAC PLANS
BUILDING ELECTRICAL	
BE-001	ELECTRICAL SYMBOLS LIST AND GENERAL NOTES
BE-002	ELECTRICAL LIGHTING CONTROL MATRIX
BE-003	ELECTRICAL DETAILS
BE-004	ELECTRICAL SCHEDULES 1
BE-005	ELECTRICAL SCHEDULES 2
BE-200	BUILDING A - LIGHTING FLOOR PLAN
BE-201	BUILDING A - LIGHTING SECOND FLOOR PLAN
BE-202	BUILDING A - POWER FLOOR PLAN
BE-203	BUILDING A - POWER SECOND FLOOR PLAN
BE-204	BUILDING A - LABORATORY POWER FLOOR PLAN
BE-205	BUILIDNG A - ELECTRICAL SINGLE LINE DIAGRAMS
TECHNOLOGY	
T-001	TECHNOLOGY SYMBOL LIST AND GENERAL NOTES
T-200	BUILDING A - TECHNOLOGY FLOOR PLAN
T-201	BUILDING A - TECHNOLOGY MEZZANINE PLAN
PROCESS AND INSTRUMENTATION	
I-001	LEGEND, SYMBOLS AND ABBREVIATIONS 1
I-002	LEGEND, SYMBOLS AND ABBREVIATIONS 2
I-110	INFLUENT PUMP STATION 1
I-111	INFLUENT PUMP STATION 2
I-130	RECYLE/DRAIN PUMP STATION
I-231	RAW SEWAGE SCREENS 1
I-232	RAW SEWAGE SCREENS 2
I-233	SCREENINGS CONVEYANCE & PROCESSING
I-241	GRIT REMOVAL BASIN
I-242	GRIT CLASSIFIER
I-251	SOLIDS DEWATERING 1

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
I-252	SOLIDS DEWATERING 2
I-253	POLYMER MAKEDOWN
I-311	PRIMARY CLARIFIER NO. 1
I-312	PRIMARY CLARIFIER NO. 2
I-313	PRIMARY CLARIFIER NO. 3
I-314	PRIMARY EFFLENT DISTRIBUTION STRUCTURE
I-315	PRIMARY SLUDGE PUMPS
I-316	PRIMARY SCUM PUMP STATION
I-321	ODOR CONTROL
I-400	AERATION BLOWERS
I-410	AERATION BASIN 1
I-411	AERATION BASIN 1
I-412	AERATION BASIN 3
I-430	MIXED LIQUOR CONTROL STRUCTURE (MLCS)
I-440	SECONDARY CLARIFIER 60 (EXISTING)
I-441	SECONDARY CLARIFIER 60 RAS PUMP STATION
I-442	SECONDARY CLARIFIER 60 WAS PUMP STATION
I-450	SECONDARY CLARIFIER 90
I-451	SECONDARY CLARIFIER 90 RAS PUMP STATION
I-452	SECONDARY CLARIFIER 90 WAS PUMP STATION
I-510	TERTIARY FILTER NO. 1
I-511	TERTIARY FILTER NO. 2
I-512	TERTIARY FILTER NO. 3
I-520	UV DISINFECTION
I-530	UTILITY WATER PUMP STATION
I-550	EFFLUENT FLOW MONITORING
I-600	SLUDGE BLEND TANK AND MIXING
I-610	SOLIDS THICKENING AND DIGESTER FEED PUMPING
I-611	BOILER AND HEAT EXCHANGER
I-612	HOT WATER LOOP
I-613	WASTE GAS BURNER
I-614	SOLIDS BUILIDNG ODOR CONTROL
I-630	PRIMARY DIGESTER AND DIGESTER MIXING
I-640	DIGESTED SLUDGE HOLDING TANK AND MIXING
I-001	LEGEND, SYMBOLS AND ABBREVIATIONS 1

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
I-002	LEGEND, SYMBOLS AND ABBREVIATIONS 2
I-110	INFLUENT PUMP STATION 1
I-111	INFLUENT PUMP STATION 2
I-130	RECYLE/DRAIN PUMP STATION
I-231	RAW SEWAGE SCREENS 1
I-232	RAW SEWAGE SCREENS 2
ELECTRICAL	
E-001	ELECTRICAL ABBREVIATIONS
E-002	ELECTRICAL SYMBOL LEGEND
E-003	ELECTRICAL DETAILS 1
E-004	ELECTRICAL DETAILS 2
E-005	ELECTRICAL DETAILS 3
E-006	ELECTRICAL DETAILS 4
E-007	ELECTRICAL DETAILS 5
E-008	ELECTRICAL DETAILS 6
E-009	ELECTRICAL DETAILS 7
E-010	EXISTING CONDITIONS AND DEMOLITION ONE-LINE DIAGRAM
E-011	SERVICE ENTRANCE ONE-LINE DIAGRAM
E-012	MCC-100 ONE-LINE DIAGRAM
E-013	MCC-200 ONE-LINE DIAGRAM
E-014	MCC-300 ONE-LINE DIAGRAM
E-015	MCC-400 ONE-LINE DIAGRAM
E-016	MCC-500 ONE-LINE DIAGRAM
E-020	POWER CONDUIT SCHEDULE 1
E-021	POWER CONDUIT SCHEDULE 2
E-022	POWER CONDUIT SCHEDULE 3
E-023	POWER CONDUIT SCHEDULE 4
E-024	POWER CONDUIT SCHEDULE 5
E-025	POWER CONDUIT SCHEDULE 6
E-026	GROUNDING CONDUIT SCHEDULE
E-027	CONTROL CONDUIT SCHEDULE 1
E-028	CONTROL CONDUIT SCHEDULE 2
E-029	CONTROL CONDUIT SCHEDULE 3
E-030	CONTROL CONDUIT SCHEDULE 4
E-031	CONTROL CONDUIT SCHEDULE 5

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
E-032	CONTROL CONDUIT SCHEDULE 6
E-033	MECHANICAL & LUMINAIRE SCHEDULE
E-040	PANEL SCHEDULES 1
E-041	PANEL SCHEDULES 2
E-042	PANEL SCHEDULES 3
E-043	PANEL SCHEDULES 4
E-044	PANEL SCHEDULES 5
E-050	SERVICE ENTRANCE - RACEWAY BLOCK DIAGRAM
E-051	SERVICE ENTRANCE CONTROL & NETWORK - RACEWAY BLOCK DIAGRAM
E-052	INFLUENT PUMP STATION - RACEWAY BLOCK DIAGRAM
E-053	RAW SEWAGE SCREEN - RACEWAY BLOCK DIAGRAM
E-054	GRIT REMOVAL - RACEWAY BLOCK DIAGRAM
E-055	SOLIDS DEWATERING - RACEWAY BLOCK DIAGRAM
E-056	PRIMARY CLARIFIER - RACEWAY BLOCK DIAGRAM
E-057	HEADWORKS ODOR CONTROL - RACEWAY BLOCK DIAGRAM
E-058	AERATION BLOWERS - RACEWAY BLOCK DIAGRAM
E-059	AREATION BASINS - RACEWAY BLOCK DIAGRAM
E-060	SECONDARY CLARIFIER SC60 - RACEWAY BLOCK DIAGRAM
E-061	SECONDARY CLARIFIER SC90 - RACEWAY BLOCK DIAGRAM
E-063	TERTIARY BUILDING - RACEWAY BLOCK DIAGRAM
E-064	TERTIARY FILTERS - RACEWAY BLOCK DIAGRAM
E-065	UV DISINFECTION - RACEWAY BLOCK DIAGRAM
E-066	UTILITY WATER SYSTEM - RACEWAY BLOCK DIAGRAM
E-067	OUTFALL - RACEWAY BLOCK DIAGRAM
E-068	SOLIDS BUILDING - RACEWAY BLOCK DIAGRAM
E-069	SOLIDS BUILDING ODOR CONTROL - RACEWAY BLOCK DIAGRAM
E-070	SLUDGE BLEND TANK - RACEWAY BLOCK DIAGRAM
E-071	PRIMARY DIGESTER - RACEWAY BLOCK DIAGRAM
E-072	DIGESTED SLUDGE STORAGE TANK - RACEWAY BLOCK DIAGRAM
E-100	ELECTRICAL SITE DEMOLITION PLAN
E-101	ELECTRICAL OVERALL SITE PLAN
E-102	ELECTRICAL SITE LIGHTING PLAN
E-103	ELECTRICAL HAZARDOUS LOCATION PLAN
E-104	MAIN ELECTRICAL & BLOWER BUILDING FLOOR PLAN
E-105	MAIN ELECTRICAL & BLOWER BUILDING ELEVATIONS

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
E-106	SOUTH ELECTRICAL BUILDING DEMOLITION FLOOR PLAN
E-107	SOUTH ELECTRICAL BUILDING NEW FLOOR PLAN
E-108	SOUTH ELECTRICAL BUILDING MCC-300 ELEVATIONS
E-110	INFLUENT PUMP STATION OVERALL SITE PLAN
E-111	INFLUENT PUMP STATION HAZARDOUS LOCATION PLAN
E-112	INFLUENT PUMP STATION ELECTRICAL PLAN & SECTION
E-113	INFLUENT PUMP STATION PUMP PANEL & STAND ELEVATIONS
E-130	RECYCLE DRAIN PUMP STATION HAZARDOUS LOCATION PLAN
E-131	RECYCLE DRAIN PUMP STATION ELECTRICAL PLAN & SECTIONS
E-132	RECYCLE DRAIN PUMP STATION DETAILS
E-201	BUILDING A HEADWORKS HAZARDOUS LOCATION PLAN
E-202	BUILDING A POWER & CONTROL PLAN
E-203	BUILDING A LIGHTING PLAN
E-204	BUILDING A ELECTRICAL ROOM ENLARGED PLAN
E-231	RAW SEWAGE SCREEN ELECTRICAL PLAN
E-240	GRIT REMOVAL HAZARDOUS LOCATION PLAN
E-241	GRIT REMOVAL ELECTRICAL PLAN & SECTIONS
E-251	SOLIDS DEWATERING ELECTRICAL PLAN
E-311	PRIMARY CLARIFIER ELECTRICAL PLAN
E-312	PRIMARY CLARIFIER ELECTRICAL SECTIONS & DETAILS
E-410	AERATION BASINS ENLARGED SITE PLAN
E-411	AERATION BASINS LIGHTING & RECEPTACLE PLAN
E-412	AERATION BASINS 1&2 ELECTRICAL PLAN & SECTION
E-414	AERATION BASIN 3 ELECTRICAL PLAN & SECTIONS
E-440	SECONDARY CLARIFIERS ENLARGED SITE PLAN
E-441	SECONDARY CLARIFIER SC60 ELECTRICAL PLAN & SECTIONS
E-442	SC60 RAS & WAS PUMP STATION ELECTRICAL PLAN & SECTIONS
E-443	SC60 RAS & WAS PUMP STATION DETAILS
E-450	SECONDARY CLARIFIER SC90 ELECTRICAL PLAN & SECTIONS
E-451	SECONDARY CLARIFIER SC90 RAS PUMP STATION PLAN & SECTION
E-452	SECONDARY CLARIFIER SC90 WAS PUMP STATION PLAN & SECTION
E-453	SC90 RAS & WAS PUMP STATION DETAILS
E-500	TERTIARY AREA POWER & CONTROL PLAN
E-501	TERTIARY AREA LIGHTING & RECEPTACLE PLAN
E-502	TERTIARY BUILDING ELECTRICAL PLAN

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
E-510	TERTIARY FILTERS ELECTRICAL PLAN
E-520	UV DISINFECTION ELECTRICAL PLAN
E-600	SOLIDS BUILDING POWER & CONTROL PLAN
E-601	SOLIDS BUILDING LIGHTING & RECEPTACLE PLAN
E-602	SOLIDS BUILDING ELECTRICAL ROOM FLOOR PLAN
E-620	SLUDGE BLEND TANK ELECTRICAL PLAN & SECTIONS
E-630	PRIMARY DIGESTER OVERALL SITE PLAN
E-631	PRIMARY DIGESTER SECTIONS
E-640	DIGESTED SLUDGE STORAGE TANK ELECTRICAL PLAN & SECTIONS
E-901	INFLUENT PUMP STATION - MOTOR SCHEMATIC 1
E-902	INFLUENT PUMP STATION PDP-110-01 LCS
E-903	INFLUENT PUMP STATION - MOTOR SCHEMATIC 2
E-904	INFLUENT PUMP STATION - MOTOR SCHEMATIC 3
E-905	INFLUENT PUMP STATION PDP-110-02 LCS
E-906	INFLUENT PUMP STATION PDP-110-03 LCS
E-907	RAW SEWAGE SCREEN VFD - MOTOR SCHEMATIC
E-908	RAW SEWAGE SCREENS - LOCAL CONTROL STATION
E-909	SCREENINGS WASHPRESS - MOTOR SCHEMATIC
E-910	GRIT CLASSIFIER - MOTOR SCHEMATIC
E-911	SCREENINGS - LOCAL CONTROL STATION
E-912	GRIT REMOVAL SYSTEM - MOTOR SCHEMATIC
E-913	GRIT REMOVAL SYSTEM - LOCAL CONTROL STATION
E-914	PRIMARY CLARIFIER SLUDGE COLLECTOR - MOTOR SCHEMATIC
E-915	PRIMARY CLARIFIER SCUM COLLECTOR - MOTOR SCHEMATIC
E-916	PRIMARY SLUDGE AND SCUM COLLECTOR - LOCAL CONTROL STATION
E-917	PRIMARY CLARIFIER SLUDGE PUMP - MOTOR SCHEMATIC
E-918	PRIMARY CLARIFIER SLUDGE PUMP - LOCAL CONTROL STATION
E-919	PRIMARY SCUM PUMP - MOTOR SCHEMATIC
E-920	PRIMARY SCUM PUMP - LOCAL CONTROL STATION
E-921	RECYCLED DRAIN PUMP STATION - MOTOR SCHEMATIC
E-922	RECYCLED DRAIN PUMP STATION - PDP-130-01
E-923	HEADWORKS ODOR CONTROL BLOWER - MOTOR SCHEMATIC
E-924	HEADWORKS ODOR CONTROL BLOWER - LOCAL CONTROL STATION
E-925	AERATION BASIN SWING-N MIXER - MOTOR SCHEMATIC
E-926	AERATION BASIN SWING-N MIXER - LOCAL CONTROL STATION

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
E-927	AERATION BASIN IMLR PUMP VFD - MOTOR SCHEMATIC
E-928	AERATION BASIN IMLR PUMP - LOCAL CONTROL STATION
E-929	SECONDARY CLARIFIER DRIVE - MOTOR SCHEMATIC
E-930	SECONDARY CLARIFIER DRIVE - LOCAL CONTROL STATION
E-931	RAS PUMP VFD - MOTOR SCHEMATIC
E-932	SC 60 RAS PUMP - LOCAL CONTROL STATION
E-933	SC 90 RAS PUMP - LOCAL CONTROL STATION
E-934	WAS PUMP VFD - MOTOR SCHEMATIC
E-935	WAS PUMP VFD - LOCAL CONTROL STATION
E-936	TERTIARY FILTER DRIVE - MOTOR SCHEMATIC
E-937	TERTIARY FILTER DRIVE - LOCAL CONTROL STATION
E-938	TERTIARY FILTER BACKWASH PUMP - MOTOR SCHEMATIC
E-939	TERTIARY FILTER BACKWASH PUMP - LOCAL CONTROL STATION
E-940	UTILITY WATER PUMP - MOTOR SCHEMATIC
E-941	UTILITY WATER PUMP - LOCAL CONTROL STATION
E-942	SLUDGE BLEND TANK MIXING PUMP - MOTOR SCHEMATIC
E-943	SLUDGE BLEND TANK MIXING PUMP - LOCAL CONTROL STATION
E-944	BLENDED SLUDGE PUMP - MOTOR SCHEMATIC
E-945	BLENDED SLUDGE PUMP - LOCAL CONTROL STATION
E-946	THICKENER FLOCC TANK MIXER - MOTOR SCHEMATIC
E-947	THICKENER FLOCC TANK MIXER - LOCAL CONTROL STATION
E-948	THICKENER BLENDED SLUDGE PUMP - MOTOR SCHEMATIC
E-949	THICKENER BLENDED SLUDGE PUMP - LOCAL CONTROL STATION
E-950	DIGESTED SLUDGE RECIRCULATION PUMP - MOTOR SCHEMATIC
E-951	DIGESTED SLUDGE RECIRCULATION PUMP - LOCAL CONTROL STATION
E-952	HOT WATER PUMP - MOTOR SCHEMATIC
E-953	HOT WATER PUMP - LOCAL CONTROL STATION
E-954	DIGESTER MIXING PUMP - MOTOR SCHEMATIC
E-955	DIGESTER MIXING PUMP - LOCAL CONTROL STATION
E-956	DIGESTED SLUDGE HOLDING TANK MIXING PUMP - MOTOR SCHEMATIC
E-957	DIGESTED SLUDGE HOLDING TANK MIXING PUMP - LOCAL CONTROL STATION
E-958	DIGESTED SLUDGE TRANSFER PUMP - MOTOR SCHEMATIC
E-959	DIGESTED SLUDGE TRANSFER PUMP - LOCAL CONTROL STATION
E-960	SOLIDS ODOR CONTROL BLOWER - MOTOR SCHEMATIC
E-961	SOLIDS ODOR CONTROL BLOWER - LOCAL CONTROL STATION

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
INSTRUMENTATION AND CONTROL	
IC-001	INSTRUMENTATION & CONTROL ABBREVIATIONS
IC-002	INSTRUMENTION & CONTROL SYMBOL LEGEND
IC-006	ETHERNET COMMUNICATIONS INTERCONNECT DIAGRAM
IC-010	MNP-100 MAIN PLC OT NETWORK PANEL LAYOUT - FRONT & READ VIEW
IC-011	MNP-100 MAIN PLC OT NETWORK PANEL LAYOUT - SIDE VIEW
IC-012	MNP-100 MAIN PLC OT NETWORK PANEL BILL OF MATERIAL
IC-013	MNP-100 MAIN PLC OT NETWORK PANEL POWER DISTRIBUTION SCHEMATIC
IC-014	MNP-100 MAIN PLC OT NETWORK PANEL IO SLOT 1 INPUT MODULE
IC-015	MNP-100 MAIN PLC OT NETWORK PANEL POINT IO SLOT 2 INPUT MODULE
IC-021	NIP-100 NETWORK INTERFACE PANEL LAYOUT (FOR CP-100)
IC-022	NIP-200 NETWORK INTERFACE PANEL LAYOUT (FOR CP-200)
IC-023	NIP-300 NETWORK INTERFACE PANEL LAYOUT (FOR CP-300)
IC-024	NIP-400 NETWORK INTERFACE PANEL LAYOUT (FOR CP-400)
IC-025	NIP-500 NETWORK INTERFACE PANEL LAYOUT (FOR CP-500)
IC-100	CP-100 ELEVATION VIEW
IC-102	CP-100 TERMINAL STRIP DETAIL
IC-103	CP-100 TERMINAL STRIP DETAIL
IC-110	CP-100 POWER DISTRIBUTION SCHEMATIC
IC-120	CP-100 DIGITAL INPUTS SLOT 3
IC-121	CP-100 DIGITAL INPUTS SLOT 4
IC-122	CP-100 DIGITAL INPUTS SLOT 5
IC-125	CP-100 DIGITAL OUTPUTS SLOT 8 (1 OF 2)
IC-126	CP-100 DIGITAL OUTPUTS SLOT 8 (2 OF 2)
IC-127	CP-100 DIGITAL OUTPUTS SLOT 9 (1 OF 2)
IC-128	CP-100 DIGITAL OUTPUTS SLOT 9 (2 OF 2)
IC-130	CP-100 ANALOG INPUTS SLOT 12 (1 OF 2)
IC-131	CP-100 ANALOG INPUTS SLOT 12 (2 OF 2)
IC-132	CP-100 ANALOG INPUTS SLOT 13 (1 OF 2)
IC-133	CP-100 ANALOG INPUTS SLOT 13 (2 OF 2)
IC-135	CP-100 ANALOG OUTPUTS SLOT 15 (1 OF 2)
IC-136	CP-100 ANALOG OUTPUTS SLOT 15 (2 OF 2)
IC-140	CP-100 INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 0
IC-141	CP-100 INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 1
IC-142	CP-100 INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 2

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
IC-143	CP-100 INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 3
IC-144	CP-100 INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 0
IC-145	CP-100 INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 1
IC-146	CP-100 INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 2
IC-147	CP-100 INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 3
IC-200	CP-200 ELEVATION VIEW
IC-202	CP-200 TERMINAL STRIP DETAIL
IC-203	CP-200 TERMINAL STRIP DETAIL
IC-204	CP-200 POWER DISTRIBUTION SCHEMATIC
IC-220	CP-200 DIGITAL INPUTS SLOT 3
IC-221	CP-200 DIGITAL INPUTS SLOT 4
IC-222	CP-200 DIGITAL INPUTS SLOT 5
IC-225	CP-200 DIGITAL OUTPUTS SLOT 8 (1 OF 2)
IC-226	CP-200 DIGITAL OUTPUTS SLOT 8 (2 OF 2)
IC-227	CP-200 DIGITAL OUTPUTS SLOT 9 (1 OF 2)
IC-228	CP-200 DIGITAL OUTPUTS SLOT 9 (2 OF 2)
IC-230	CP-200 ANALOG INPUTS SLOT 12 (1 OF 2)
IC-231	CP-200 ANALOG INPUTS SLOT 12 (2 OF 2)
IC-232	CP-200 ANALOG INPUTS SLOT 13 (1 OF 2)
IC-233	CP-200 ANALOG INPUTS SLOT 13 (2 OF 2)
IC-235	CP-200 ANALOG OUTPUTS SLOT 15 (1 OF 2)
IC-236	CP-200 ANALOG OUTPUTS SLOT 15 (2 OF 2)
IC-240	CP-200 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 0
IC-241	CP-200 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 1
IC-242	CP-200 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 2
IC-243	CP-200 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 3
IC-244	CP-200 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 4
IC-245	CP-200 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 5
IC-246	CP-200 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 6
IC-247	CP-200 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 7
IC-300	CP-300 ELEVATION VIEW
IC-302	CP-300 TERMINAL STRIP DETAIL
IC-303	CP-300 TERMINAL STRIP DETAIL
IC-310	CP-300 POWER DISTRIBUTION SCHEMATIC
IC-320	CP-300 DIGITAL INPUTS SLOT 1

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
IC-321	CP-300 DIGITAL INPUTS SLOT 2
IC-330	CP-300 ANALOG INPUTS SLOT 6 (1 OF 2)
IC-331	CP-300 ANALOG INPUTS SLOT 6 (2 OF 2)
IC-340	CP-300 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 0
IC-341	CP-300 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 1
IC-342	CP-300 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 2
IC-343	CP-300 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 3
IC-344	CP-300 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 4
IC-345	CP-300 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 5
IC-346	CP-300 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 6
IC-347	CP-300 INSTRUMENT LOOP DIAGRAM SLOT 6 POINT 7
IC-400	CP-400 ELEVATION VIEW
IC-402	CP-400 TERMINAL STRIP DETAIL
IC-403	CP-400 TERMINAL STRIP DETAIL
IC-410	CP-400 POWER DISTRIBUTION SCHEMATIC
IC-420	CP-400 DIGITAL INPUTS SLOT 3
IC-421	CP-400 DIGITAL INPUTS SLOT 4
IC-422	CP-400 DIGITAL INPUTS SLOT 5
IC-430	CP-400 ANALOG INPUTS SLOT 7
IC-431	CP-400 ANALOG INPUTS SLOT 8
IC-440	CP-400 INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 0
IC-441	CP-400 INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 1
IC-442	CP-400 INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 2
IC-443	CP-400 INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 3
IC-444	CP-400 INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 0
IC-445	CP-400 INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 1
IC-446	CP-400 INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 2
IC-447	CP-400 INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 3
IC-500	CP-500 ELEVATION VIEW
IC-502	CP-500 TERMINAL STRIP DETAIL
IC-503	CP-500 TERMINAL STRIP DETAIL
IC-510	CP-500 POWER DISTRIBUTION SCHEMATIC
IC-520	CP-500 DIGITAL INPUTS SLOT 3
IC-521	CP-500 DIGITAL INPUTS SLOT 4
IC-522	CP-500 DIGITAL INPUTS SLOT 5

Table 1-2. Sheet List Summary by Discipline	
Sheet No.	Sheet Description
IC-530	CP-500 DIGITAL INPUTS SLOT 7
IC-531	CP-500 DIGITAL INPUTS SLOT 8
IC-540	INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 0
IC-541	INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 1
IC-542	INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 2
IC-543	INSTRUMENT LOOP DIAGRAM SLOT 7 POINT 3
IC-544	INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 0
IC-545	INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 1
IC-546	INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 2
IC-547	INSTRUMENT LOOP DIAGRAM SLOT 8 POINT 3

Attachment B

Budget Spreadsheet

West Yost Associates **PROJECT: Sweet Home MWRF Improvements Final Design**	PE/PS/PG II $288 Moolenkamp	PE/PS/PG I $273 Van Meter	SE/SS/SG I $244 Barry	PE/PS/PG II $288 Costello	SE/SS/SG I $244 Carpenter	PE/PS/PG II $288 Schilling	AE/AS/AG I $204 Drath	ESG II $190 Lang/Retzlaff	SE/SS/SG I $244 Erkert	EM/SM/GM I $303 Kapur	CAD II $165 Barber	ADM III $131 Colorado	EM/SM/GM II $315 Meyer	Labor Hours	Labor Fee	Technology & Admin 6%	ACE	LCE	IFE	MMJ	CAD	MZC	SWA	TAG	Sub. w/ markup 10%	Direct Other Costs	Total Costs
Task 1 Project Management																											
1.01 Add'l Monthly Project Status Reports and Invoices	4	24										12		40	$ 9,276	$ 557								$		$ 9,833
1.02 Add'l Team Coordination Activities		48	24	8	8	8								96	$ 25,520	$ 1,531								$		$ 27,051
1.03 City Council Meetings		24										4		28	$ 7,076	$ 425								$	$ 400	$ 7,901
Subtotal, 1.03 (hours)	**4**	**96**	**24**	**8**	**8**	**8**	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**164**												
Subtotal, 1.03 ($)	**$ 1,152**	**$ 26,208**	**$ 5,856**	**$ 2,304**	**$ 1,952**	**$ 2,304**						**$ 2,096**			**$ 41,872**	**$ 2,512**									**$ 400**	**$ 44,784**
Task 2 Additional Project Planning and Coordination Activities																										
2.01 New Outfall Mixing Zone Study		8								16		2	8	34	$ 9,814	$ 589					$ 32,000			$ 35,200	$ 500	$ 46,103
2.02 South Santiam River Bathymetry & MZ Model Confirmation		8	4							8		2		22	$ 5,846	$ 351					$ 38,000			$ 41,800	$ 2,500	$ 50,497
2.03 New South Santiam River Outfall Permitting Support Services		16	8							68		2	8	102	$ 29,706	$ 1,782									$ 10,000	$ 41,488
2.04 Update General Contractor Pre-Qualification		16	28									6		50	$ 11,986	$ 719									$ 200	$ 12,905
Subtotal, 2.04 (hours)	**0**	**48**	**40**	**0**	**0**	**0**	**0**	**0**	**0**	**92**	**0**	**12**	**16**	**208**												
Subtotal, 2.04 ($)		**$ 13,104**	**$ 9,760**							**$ 27,876**		**$ 1,572**	**$ 5,040**		**$ 57,352**	**$ 3,441**					**$ 70,000**			**$ 77,000**	**$ 13,200**	**$ 150,993**
Task 3 MRWF Improvements Project Final Design																										
3.01 MWRF Improvements 90% Final Design		80	180	240	160	90	240	360	240	0	460	80	48	2178	$ 477,260	$ 28,636	$ 152,700	$ 98,645	$ 61,400	$ 7,400	$ 50,398		$ 50,962	$ 41,540	$ 509,350	$ 1,500	$ 1,016,745
3.02 MWRF Improvements 90% Design Workshop		12	12	12	12	8	8	8			4	2		78	$ 18,966	$ 1,138	$ 1,200	$ 1,500	$ 1,000				$ 1,000		$ 5,170	$ 500	$ 25,774
3.03 Permitting Reviews and Coordination		32	8	4	4	4	4	8	4	16		4		88	$ 22,652	$ 1,359	$ 800	$ 500	$ 500	$ 500			$ 11,776	$ 5,000	$ 20,984		$ 44,995
3.04 MWRF Improvements Final Contract Documents		40	28	37	21	7	42	56	38	0	81	40	24	414	$ 90,193	$ 5,412	$ 17,200	$ 58,515	$ 8,000		$ 10,000		$ 11,776		$ 116,040	$ 3,500	$ 215,145
3.05 South Santiam River Outfall Final Contract Documents		12	40				60	24			128	24	8	296	$ 56,620	$ 3,397	$ 2,200								$ 2,420		$ 62,437
Subtotal, 3.05 (hours)	**0**	**176**	**268**	**293**	**197**	**109**	**354**	**456**	**282**	**16**	**673**	**150**	**80**	**3054**												
Subtotal, 3.05 ($)		**$ 48,048**	**$ 65,392**	**$ 84,384**	**$ 48,068**	**$ 31,392**	**$ 72,216**	**$ 86,640**	**$ 68,808**	**$ 4,848**	**$ 111,045**	**$ 19,650**	**$ 25,200**		**$ 665,691**	**$ 39,941**	**$ 174,100**	**$ 159,160**	**$ 70,900**	**$ 7,900**	**$ 60,398**		**$ 75,514**	**$ 46,540**	**$ 653,963**	**$ 5,500**	**$ 1,365,096**
TOTAL (hours)	**4**	**320**	**332**	**301**	**205**	**117**	**354**	**456**	**282**	**108**	**673**	**178**	**96**	**3,426**												
TOTAL ($)	**$ 1,152**	**$ 87,360**	**$ 81,008**	**$ 86,688**	**$ 50,020**	**$ 33,696**	**$ 72,216**	**$ 86,640**	**$ 68,808**	**$ 32,724**	**$ 111,045**	**$ 23,318**	**$ 30,240**		**$ 764,915**	**$ 45,895**	**$ 174,100**	**$ 159,160**	**$ 70,900**	**$ 7,900**	**$ 60,398**	**$ 70,000**	**$ 75,514**	**$ 46,540**	**$ 730,963**	**$ 19,100**	**$ 1,560,873**

Attachment C

West Yost's Billing Rate Schedule

2023 Billing Rate Schedule

(Effective January 1, 2023 through December 31, 2023)*

POSITIONS	LABOR CHARGES (DOLLARS PER HOUR)
ENGINEERING	
Principal/Vice President	$318
Engineer/Scientist/Geologist Manager I / II	$303 / $315
Principal Engineer/Scientist/Geologist I / II	$273 / $288
Senior Engineer/Scientist/Geologist I / II	$244 / $255
Associate Engineer/Scientist/Geologist I / II	$204 / $217
Engineer/Scientist/Geologist I / II	$163 / $190
Engineering Aide	$95
Field Monitoring Services	$118
Administrative I / II / III / IV	$85 / $108 / $131 / $144
ENGINEERING TECHNOLOGY	
Engineering Tech Manager I / II	$312 / $315
Principal Tech Specialist I / II	$286 / $297
Senior Tech Specialist I / II	$262 / $276
Senior GIS Analyst	$238
GIS Analyst	$225
Technical Specialist I / II / III / IV	$168 / $192 / $216 / $241
Technical Analyst I / II	$121 / $144
Technical Analyst Intern	$97
Cross-Connection Control Specialist I / II / III / IV	$125 / $136 / $152 / $170
CAD Manager	$190
CAD Designer I / II	$147 / $165
CONSTRUCTION MANAGEMENT	
Senior Construction Manager	$306
Construction Manager I / II / III / IV	$185 / $199 / $212 / $268
Resident Inspector (Prevailing Wage Groups 4 / 3 / 2 / 1)	$163 / $181 / $201 / $209
Apprentice Inspector	$147
CM Administrative I / II	$79 / $106
Field Services	$210

- Technology and Communication charges including general and CAD computer, software, telephone, routine in-house copies/prints, postage, miscellaneous supplies, and other incidental project expenses will be billed at 6% of West Yost labor.
- Outside Services such as vendor reproductions, prints, shipping, and major West Yost reproduction efforts, as well as Engineering Supplies, etc. will be billed at actual cost plus 15%.
- The Federal Mileage Rate will be used for mileage charges and will be based on the Federal Mileage Rate applicable to when the mileage costs were incurred. Travel other than mileage will be billed at cost.
- Subconsultants will be billed at actual cost plus 10%.
- Expert witness, research, technical review, analysis, preparation and meetings billed at 150% of standard hourly rates. Expert witness testimony and depositions billed at 200% of standard hourly rates.
- A Finance Charge of 1.5% per month (an Annual Rate of 18%) on the unpaid balance will be added to invoice amounts if not paid within 45 days from the date of the invoice.

* This schedule is updated annually

2023 Billing Rate Schedule

(Effective January 1, 2023 through December 31, 2023)*

Equipment Charges

EQUIPMENT	BILLING RATES
2" Purge Pump & Control Box	$300 / day
Aquacalc / Pygmy or AA Flow Meter	$28 / day
Emergency SCADA System	$35 / day
Field Vehicles (Groundwater)	$1 / mile
Gas Detector	$80 / day
Generator	$60 / day
Hydrant Pressure Gauge	$10 / day
Hydrant Pressure Recorder, Impulse (Transient)	$55 / day
Hydrant Pressure Recorder, Standard	$40 / day
Low Flow Pump Back Pack	$135 / day
Low Flow Pump Controller	$200 / day
Powers Water Level Meter	$32 / day
Precision Water Level Meter 300ft	$30 / day
Precision Water Level Meter 500ft	$40 / day
Precision Water Level Meter 700ft	$45 / day
QED Sample Pro Bladder Pump	$65 / day
Stainless Steel Wire per foot	$ 0.03 / day
Storage Tank	$20 / day
Sump Pump	$24 / day
Transducer Components (per installation)	$23 / day
Trimble GPS – Geo 7x	$220 / day
Tube Length Counter	$22 / day
Turbidity Meter	$30 / day
Vehicle (Construction Management)	$10 / hour
Water Flow Probe Meter	$20 / day
Water Quality Meter	$50 / day
Water Quality Multimeter	$185 / day
Well Sounder	$30 / day

* This schedule is updated annually

REQUEST FOR COUNCIL ACTION

Title:	Request for Council Action - Mahler WRF Electrical Equipment Procurement
Preferred Agenda:	February 14, 2023
Submitted By:	Trish Rice, Engineering Technician Greg Springman, Public Works Director
Reviewed By:	Kelcey Young, City Manager
Type of Action:	Resolution ___ Motion ____ Roll Call _X_ Other ____
Relevant Code/Policy:	N/A
Towards Council Goal:	1.1 Develop specific steps for implementation of the adopted infrastructure master plans.
Attachments:	TAG task order quote Procurement documents set

Purpose of this RCA:

Staff requests authorization to procure owner-supplied electrical equipment through the City's Integrator of Record for the Mahler WRF Improvements Project.

Background/Context:

On November 8, 2022, Council approved the Engineer's recommendation for the Interim Improvements Project including pre-ordering of long-lead electrical equipment for the subsequent Improvements Project. Staff tasked the Engineer of Record (West Yost) and the Integrator of Record (The Automation Group, aka TAG) with preparing the equipment specifications and contract documents. The task order was developed as a joint effort, however it will be executed directly with TAG under the Integrator of Record contract.

The equipment to be procured is the plant's standby generator, main switchgear, and automatic transfer switch. It will be supplied to the construction contractor for installation in the Mahler WRF Improvements Project and programmed/integrated by TAG. TAG has completed the design and solicited quotes, after which it was determined to require formal bidding to comply with state procurement law. The procurement was advertised for bid on December 15, 2022 and bids closed on January 10, 2023. We received two bids for the switchgear and transfer switch and four bids for the generator, as summarized in TAG's quote.

The cost of this task order is $898,364.03 including 3% for bonds and 4% for owner-controlled contingency and will be spread over multiple fiscal years. The FY23 total of up to $164,286.22 includes design and bid services, bonding, contingency, and 10% down payment for the equipment and will be funded by the $7M state earmark. The remaining $734,077.80 is funded

by ARPA and will be payable as expenses are incurred in FY24/FY25 for submittal reviews, equipment delivery, and construction services.

Task	Price	FY 23	FY24/FY25
Equipment			
Switchgear & ATS	$ 481,252.00	$ 48,125.20	$ 433,126.80
Generator	$ 318,490.00	$ 31,849.00	$ 286,641.00
FY23 costs			
original design/bidding	$ 15,300.00	$ 15,300.00	
rebid Nov	$ 4,800.00	$ 4,800.00	
rebid Dec	$ 4,500.00	$ 4,500.00	
Contingency (4%)	$ 33,546.08	$ 33,546.08	
Bonds (3%)	$ 26,165.94	$ 26,165.94	
FY24/FY25 costs			
Construction Services - Switchgear & ATS	$ 7,950.00		$ 7,950.00
Construction Services - Generator	$ 6,360.00		$ 6,360.00
Total	**$ 898,364.02**	**$ 164,286.22**	**$ 734,077.80**

Staff recommends executing this task order with TAG to lock in the equipment prices and start the clock with the vendors for delivery time, to ensure that the equipment is available to the construction contractor during the main phase of the construction project.

The Challenge/Problem:

To make efficient use of limited funds to complete needed wastewater treatment improvements and satisfy DEQ requirements and state funding timelines.

Stakeholders:

- *City Residents*. Residents are the customers who deserve good service with the highest return on their taxes and fees that we can provide, and who trust the City to maintain their infrastructure systems at a high level of service.
- *Council Members*. Council members are the voice of the citizens we serve. Each member of this group is interested in providing the best service possible at the lowest possible cost. They must balance leadership with representation.
- *Public Works Department Staff.* This project will greatly improve the operability of the WWTP which is currently undersized and beyond its serviceable lifespan. Staff spends significant time fixing broken down equipment and fighting with system inefficiencies.
- *Management Team*. Comprised of five department heads, each with a responsibility to the citizens and City Manager to run their day-to-day operations as efficiently as possible.
- *Oregon DEQ*. The WWTP upgrade project is required to comply with DEQ regulations.

Issues and Financial Impacts:

The cost of this task order is $898,364.03 including 3% for bonds and 4% for owner-controlled contingency and will be spread over multiple fiscal years. The FY23 total of up to $164,286.22 includes design and bid services, bonding, contingency, and 10% down payment for the equipment and will be funded by the $7M state earmark. The remaining $734,077.80 is funded by ARPA and will be payable as expenses are incurred in FY24/FY25 for submittal reviews, equipment delivery, and construction services.

Elements of a Stable Solution:

A stable solution will provide efficient completion of needed facility improvements and make full use of the funding from the State of Oregon for this project.

Options:

1. *Option 1 – Move to cancel the project.* Not recommended.
2. *Option 2 – Move to reject all bids and re-bid the project.* The project will remain in the CIP. The delay is likely to result in cost increases due to industry inflation.
3. *Option 3 – Move to execute the procurement as presented.* Staff will execute the task order with TAG and give notice to proceed.

Recommendation:

Staff recommends *Option 3 – Move to execute the procurement as presented.*

The Automation Group, Inc.
www.tag-inc.us
CCB #172838
Phone: 541-359-3755

Quote #221119G
Jan. 24, 2023

Trish Rice
City of Sweet Home

RE: Sweet Home WWTP - Owner Supplied Equipment

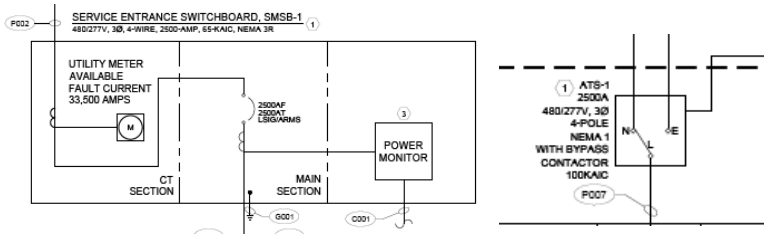
Project Scope:
TAG is providing a Quote to supply the following materials for early procurement due to long lead times for the Waste Water Treatment Facility Project.

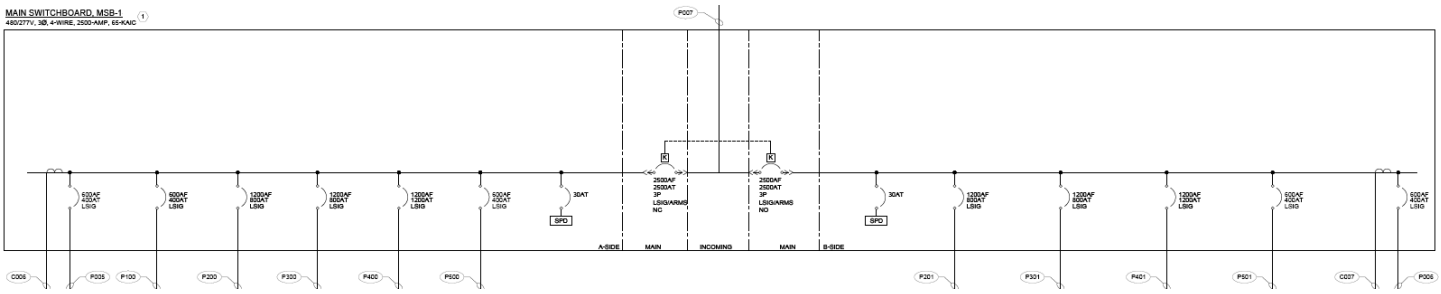
Fee Schedule:

Task	Qty	Price Each	Markup	Calc Price
			5% overhead 10% Markup	
Switch Gear & ATS	1	$418,480.00	15.00%	$481,252.00
Generator	1	$276,947.83	15.00%	$318,490.00
Original Design/Bidding	102	$150.00	0.00%	$15,300.00
Rebid Nov.	32	$150.00	0.00%	$4,800.00
Rebid Dec.	30	$150.00	0.00%	$4,500.00
TAG Admin/PM - During Construction - Switch Gear & ATS	50	$159.00	0.00%	$7,950.00
TAG Admin/PM - During Construction - Generator	40	$159.00	0.00%	$6,360.00
Subtotal				**$838,652.00**
Owner Controlled Contingency (4%)	1	$159.00	4.00%	$33,546.08
Subtotal	0			**$872,198.08**
Performance and Payment Bonds (3%)	1	$159.00	3.00%	$26,165.94
		Total		**$898,364.03**

1. Switch Gear & ATS:

- SMSB-1, MSB-1 & ATS-1– per Electrical Engineers 1-line below





Bidding area comparisons Raw Cost Materials

Switch Gear & ATS	Cost $	Lead Times
Siemens (Low Bid Selected)	$418,480.00	61-68 Weeks
Eaton - NO Bid	$0.00	0
Square D	$526,914.09	66 Weeks

2. Generator:

- Cummins
  - DQFAC, Commercial Diesel Generator Set, 900kW Standby 60Hz
    - U.S. EPA, Stationary Emergency Application
    - 900DQFAC, Diesel Genset, 60Hz, 900kW
    - Duty Rating - Standby Power (ESP)
    - Emission Certification, EPA, Tier 2, NSPS CI Stationary Emergency
    - Fuel Tank - Sub Base, 1500 Gallon, UL142 Compliant
    - Compliance - Fuel Tank
    - Listing, ULC - S601 - 07
    - Listing - UL 2200
    - Alarm - High Fuel Fill
    - Fuel Tank Connection - Dual Stub Up
    - Control Mounting - Left Facing
    - PowerCommand 3.3 Controller, Paralleling Capable
    - Analog Meters - AC Output
    - LCD Control Display

- Stop Switch - Emergency, Externally Mounted
- Signals - Auxiliary, 8 Inputs/8 Outputs
- Relays - Paralleling Circuit Breaker Control
- Control Display Language - English
- Circuit Breaker or Entrance Box or Terminal Box - Left Only
- Circuit Breaker - 1600, Left, 3P, UL 600, IEC 415, UL Serv Ent 100%
- Circuit Breaker or Entrance Box or Terminal Box, Right-None
- Cert - Seismic, IBC2000, IBC2003, IBC2006, IBC2009, IBC2011
- Bottom Entry, Left
- Load Connections-None
- Indication - Ground Fault, Terminal Box (or) Circuit Breaker Box - Left
- Engine Air Cleaner - Normal Duty
- Engine Cooling - Radiator, Enhanced High Ambient Air Temperature, Ship Fitted
- Shutdown - Low Coolant Level
- Sight Glass - Coolant Level
- Coolant Heater - 208/240/480 Volts AC, 40F Minimum Ambient Temperature
- Voltage - 277/480, 3 Phase, Wye, 4 Wire
- Test Record - Strip Chart
- Test Record - Safety Shutdowns
- Cummins Certified Test Record
- Standby 5 Year 2500 Hour Parts+Labor+Travel
- Alternator - 60Hz, 3 Phase, Wye, Extended Range, 105/80C
- Literature - English
- Packing - None, Base Mounted Housing
- Alternator Heater, 120 Volt AC
- Steel Sound Attenuated Level 2 Enclosure, with Exhaust System
- Enclosure Color - Green, Steel
- Vibration Isolators - Earthquake Certified
- Cooling Air Outlet - Horizontal, Sound Attenuated

  - Battery Group34: C34-HC
  - Battery Charger-10Amp, 120/208/240VAC, 12/24V, 50/60Hz 1
  - Telematics – Cloud - Wi-Fi + Cellular + Ethernet connectivity – Modbus + J1939 (Private – NA variant)
  - Startup Service and 4-Hr Load Bank Test, Demonstration and Testing

- **Bidding area comparisons Raw Cost Materials**

Generator	Cost $	Lead Times
MTU - 1000kw	$299,785.00	70-80 Weeks
Cummins - 900kw (Low Bid Selected)	$276,947.83	58-68 Weeks
Cat - 1000kw	$429,926.00	70-80 Weeks
Kohler - 900kw	$320,871.00	58 Weeks

The Automation Group, Inc. TAG Quote

Clarification/Exclusions:

- Off loading by Owner or General Contractor
- Generator Fuel to be Provided by City
- Lead Times for specific materials are very unpredictable at this time and cannot be verified until orders are placed. We are also seeing some items slipping from the predicted delivery dates after order by a few weeks and also seeing some items showing up early. TAG will track progress on orders and provide updates.
- Payments with Credit Cards will have additional charges added to the price below based on the current % rate of the processor.

Thank you,

Gary Jenks

Gary Jenks
(541) 912-3766
gjenks@tag-inc.us

City of Sweet Home
1400 24th Avenue
Sweet Home, OR 97386

Mahler Water Reclamation Facility (MWRF)

Owner-Provided Electrical Equipment Procurement Bid Documents

Document for the Provision of
Goods and Special Services

December 2022

WEST YOST
Water. Engineered.

5 Centerpointe Dr #130,
Lake Oswego, OR 97035
(530) 756-5905
FAX (530) 756-5991

MWRF Owner-Provided Electrical Equipment Procurement
Table of Contents

BIDDING REQUIREMENTS

EJCDC C-111	Advertisement for Bidders
EJCDC C-200	Instructions to Bidders
00 40 00	Bid Form
00 43 33	Proposed Products List
00 45 19	Non-Collusion Affidavit

TECHNICAL SPECIFICATIONS

Division 26 – Electrical

26 05 53	Identification for Electrical Systems
26 24 13	Switchboards
26 32 00	Packaged Diesel Generator Assemblies
26 36 23	Automatic transfer Switch

EXHIBIT A: DRAWINGS

E-011	Service Entrance one-Line Diagram

ADVERTISEMENT FOR BIDS

CITY OF SWEET HOME, OREGON
MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED ELECTRICAL EQUIPMENT PROCUREMENT

General Notice

The Automation Group (Owner) is requesting Bids for the construction of the following Project:

CITY OF SWEET HOME MAHLER WATER RECLAMATION FACILITY
OWNER-PROVIDED ELECTRICAL EQUIPMENT PROCUREMENT

Bids for the construction of the Project will be received at The Automation Group, 4678 Isabelle St. Eugene, OR 97402 until **January 10, 2023** at **2:00 pm** local time. At that time the Bids received will be publicly opened and read.

The Project includes the following Work:

Improvements and modifications to the City of Sweet Home Mahler Water Reclamation Facility (Mahler WRF) includes furnishing all labor, materials, and equipment necessary for the procurement of electrical equipment, including the MWRF main switchboard and a new standby engine generator and appurtenances.

Obtaining the Bidding Documents

The Contract Documents may be examined at The Automation Group, 4678 Isabelle St., Eugene, OR 97402. Electronic copies of the Contract Documents will be provided by the Owner. Hard copies of the Contract Documents will be provided to the successful Bidder following Bid Award.

Instructions to Bidders

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders included in the Bidding Documents.

American Iron and Steel

Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project. All iron and steel products used in this project must be produced in the United States. The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials.

The following waivers apply to this Contract:

1. De Minimis,
2. Minor Components, and
3. Pig iron and direct reduced iron.

This Advertisement is issued by:

Owner: **The Automation Group**
By: **Gary Jenks**
Title: **Owner**
Date: **December 15, 2022**

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INSTRUCTIONS TO BIDDERS FOR PROCUREMENT CONTRACT

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ARTICLE 1—DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.04 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective Bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

2.06 *Electronic Documents*

A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of

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the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.

1. Electronic Documents that are available in native file format include:

a. Electronic Drawing files in Revit, AutoCAD MEP and AutoCAD Civil3D.

b. Digital Elevation Model (DEM) for the construction site

2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.

3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.

4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—RESERVED

ARTICLE 4—RESERVED

ARTICLE 5—SITE AND OTHER AREAS OWNER'S SAFETY PROGRAM

5.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

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5.02 *Owner's Safety Program*

A. Site visits and work at the Site is governed by Oregon OSHA requirements.

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Owner and Engineer in writing.

7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—RESERVED

ARTICLE 9—RESERVED

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items.

10.02 All prices that Bidder sets forth in its Bid will be based on the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda.

ARTICLE 11—RESERVED

ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be

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indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

C. Bidders shall provide pricing for all "A-listed" or first-named equipment suppliers in the Bid Form.

12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 All names must be printed in ink below the signatures.

12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

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ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

A. Bidders must submit a Bid on a lump sum basis for each bid item as set forth in the Bid Form.

13.02 *Additive and Deductive Unit Price Work Bid Items*

A. Bidders must submit unit prices for bid items with additional work beyond the quantities included in the Lump Sum Bid.

1. Additive and Deductive Unit Price Work Items shall include:

a. None

B. Costs for Additive and Deductive Unit Price Work Bid Items will be considered by the Owner in the evaluation of bids based on the potential impact of increased or decreased quantities for these Bid items in the course of executing the Work.

C. Bidders shall not unbalance bids for Additive and Deductive Unit Price Work Items.

13.03 *Allowances*

A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 14—SUBMITTAL OF BID

14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, the name and address of Bidder, the date of opening, the applicable words "SEALED BID" and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED" A mailed Bid must be addressed to the location designated in the Advertisement.

14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

14.04 All responses submitted are the property of the City of Sweet Home, thus subject to disclosure pursuant to Oregon Public Records law, as qualified by ORS 279B.060(6) for similar contracts. Except for information marked "Proprietary", all documents received by City shall be available for public disclosure. The City will attempt to maintain the confidentiality of materials marked "Proprietary" to the extent permitted under the Oregon Public Records law. By responding to this solicitation, Bidders waive any challenge to the City's decisions in this regard.

14.05 **Marking all, or substantially all, or your response as "Proprietary" is not permitted and may be grounds for the City considering your bid nonresponsive, at the City's sole discretion.** If your

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response contains proprietary information protected under this section, please provide an additional redacted copy.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

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B. For determination of the apparent lowest responsive and responsible Bidder, Bids will be compared on the basis of the Lump Sum Price along with potential additional costs for Additive or Deductive Additional Work Bid Items determined at the Owner's discretion.

18.06 *Protests of Solicitation*

A. Bidders are directed to the protest procedures contained in ORS 279B.405 and OAR 137-047-0730. A prospective Bidder may file a protest of the solicitation if the prospective Bidder believes that the procurement process is contrary to law or that a solicitation document is unnecessarily restrictive, is legally flawed or improperly specifies a brand name. Protests shall be submitted to the City in writing no later than ten (10) days prior to the solicitation closing date.

18.07 *Protests of Contract Award*

A. Bidders are directed to the protest procedures contained in ORS 279B.410 and OAR 137-047-0740. A Bidder may protest the award of a public contract or a notice of intent to award a public contract, whichever occurs first, if:

1. The bidder is adversely affected because the bidder would be eligible to be awarded the public contract in the event that the protest were successful; and

2. The reason for the protest is that:

a. All lower bids or higher ranked proposals are nonresponsive;

b. The contracting agency has failed to conduct the evaluation of proposals in accordance with the criteria or processes described in the solicitation materials;

c. The contracting agency has abused its discretion in rejecting the protestor's bid or proposal as nonresponsive; or

d. The contracting agency's evaluation of bids or proposals or the contracting agency's subsequent determination of award is otherwise in violation of this chapter or ORS chapter 279A.

B. Protests shall be submitted to the City in writing no later than seven (7) days following the notice of intent to award.

ARTICLE 19—RESERVED

ARTICLE 20—SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

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ARTICLE 21— RESERVED

ARTICLE 22— RESERVED

ARTICLE 23—NONDISCRIMINATION

23.01 During the performance of this contract, the Contractor shall comply with all federal and state nondiscrimination laws, including, but not limited to 42 U.S.C. 12101 et seq, the Americans with Disabilities Act (ADA).

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SECTION 00 40 00 - BID FORM

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY
OWNER-PROVIDED ELECTRICAL EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON

THIS BID IS SUBMITTED TO: The Automation Group, Inc.

Attn: Harold Barton, Project Manager
4678 Isabelle St.
Eugene, OR 97402

1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2.01 Bidder accepts all of the terms and conditions of the Advertisement for Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 45 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.

3.01 Refer to the Instructions to Bidders for forms and documents that must be executed in full and submitted with the bid.

3.02 The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, and the General Conditions.

3.03 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data and documents identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

Addendum No.	**Addendum Date**

B. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

C. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

D. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.

E. Bidder has correlated the information known to Bidder, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

F. Bidder has given OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by OWNER is acceptable to Bidder.

G. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.01 Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the price described in the following bid schedule within the time of completion specified in the Agreement.

BID SCHEDULE

Bidder shall submit a Bid as set forth in the Bid form. Submission of Bids on this schedule signifies Bidder's willingness to enter into a Contract for the price offered. Bidders offering a Bid on this schedule must be capable of completing the Work within the time period stated in the Agreement. OWNER may elect to any delete bid item from the work.

1.01 LUMP SUM WORK

A. Bidder proposes and agrees to accept as full payment the following bid amount for the Mahler WRF Owner-Provided Electrical Equipment proposed within the Bidding Documents, and certifies that this amount is based upon the undersigned's own estimate of quantities and costs and includes sales, consumer, use, and other taxes, except as provided below, overhead and profit.

B. Lump Sum Bid Price: $_____

Bidder Identification and Signatures

Name of Firm: _____

Federal Tax ID No: _____

State of Incorporation and Oregon CCB License No: _____

Bidder ☐ IS / ☐ IS NOT a "Resident Bidder" as defined by ORS 279.029.

Signature and Printed Name(s): *(If Bidder is a partnership or joint venture, all parties must sign below)*

_____ _____

_____ _____

Title _____

Date _____

END OF SECTION

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SECTION 00 43 33- PROPOSED PRODUCTS LIST

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED ELECTRICAL EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON

The Bidder states that the manufacturer of each listed item of equipment or material proposed by the Contractor for use on this Project will be as listed below:

Material Item	Description	Equipment or Material Manufacturer (Do not show Dealer or Supplier)
1	Switchboards (26 24 13)	
2	Packaged Diesel Generator Assemblies (26 32 00)	

The Bidder must include in the space provided, the name of the equipment or material manufacturer he has used in determining his Base Bid which will be used by the Successful Bidder in constructing the project. If the Bidder does not fill in any of the spaces, it will be considered that the Bidder has selected the first-named manufacturer as his selection for those spaces not filled in.

After the opening of Bids, no changes or substitutions from those listed manufacturers will be allowed without the express written approval of the Engineer. If such change is permitted by the Engineer, it will be evaluated in accordance with provisions of the Contract Documents pertaining to Specified Items/Proposed Equivalents.

Circumstances which will justify changes to the above listing are limited to the following:

1. Manufacturer is unable to meet specifications.
2. Manufacturer fails to honor original quotation upon which the Contractor's bid was based.
3. Manufacturer goes out of business or ceases to make the specified product.

It is the responsibility of the Contractor to furnish materials and equipment meeting the requirements of the Specifications, and acceptance of the bid does not constitute nor imply favorable review or approval of items proposed. The Owner reserves the right to deny approval or acceptance of any equipment or materials which do not comply with Specifications even though listed herein.

_____
(Signature)

_____
(Type or Print Name)

_____
(Title)

_____
(Company)

END OF SECTION

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SECTION 00 45 19 – NON-COLLUSION AFFIDAVIT

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED ELECTRICAL EQUIPMENT PROCUREMENT
THE AUTOMATION GROUP

STATE OF OREGON
COUNTY OF LANE

I state that I am_____(title) of_____(name of firm) and that I am authorized to make this affidavit on behalf of my firm and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder, except as disclosed on the attached appendix.

(2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

(5) _____(name of firm), its affiliates, subsidiaries, officers, directors and employees are not currently under investigation by any governmental agency for violating any non-collusion statutes and have not in the last four years been convicted of or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described in the attached appendix.

I state that_____(name of firm) understands and acknowledges that the above representations are material and important and will be relied on by the City of Sweet Home in awarding the contract(s) for which this bid is submitted. I understand, and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the City of Sweet Home of the true facts relating to the submission of bids for this contract.

_____
Authorized Signature

_____
Name of Company / Position

Sworn to and subscribed before me this_____day of_____, 20____.

_____ _____
Notary Public for the State of Oregon My Commission Expires

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SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for identification of electrical, safety, measurement, data, fire alarm, security, monitoring, control and related components and equipment.

1.02 SUBMITTALS

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

B. Submittal Format:

1. The product data shall be provided as individual PDFs for each Section, unless otherwise noted for specific items. Each PDF shall be numbered to match the specification Section numbers. Submittals not itemized and labeled as specified will be rejected as incomplete.

2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 26000.A01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.

3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

4. Submittals in PDF shall include an index, table of contents, or bookmarks with hyperlinks to the associated page of all submitted items. Index shall include each product specified with their corresponding Reference Keynote Number. Electronic submittals not containing a linked index, table of contents, or bookmarks will be rejected as incomplete.

C. Product Data

1. The initial submittal shall contain all the products, samples and data base specified. An initial submittal that does not contain all the specified data shall be returned as incomplete.

D. Samples

1. Provide a sample of each type and size of nameplate, label, tag and means of attachment specified for approval by the OWNER.

E. Quality Assurance / Quality Control Submittals

1. The CONTRACTOR shall be responsible for submitting a data base of all identification nameplates, labels, panel schedules and tags required for the Work. The data base shall be developed in the most current edition of Microsoft Excel for the OWNER's future use.

F. Closeout Submittals

1. As-built electronic copy of the identification Excel data base.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Plastic Nameplates (260553.P05).

1. Shall have a black background with white engraved letters. Nameplates for emergency functions shall be red background with white engraved letters. The nameplates shall have self adhesive rated for the environment which they are installed. The font type shall be consistent on all nameplates.

2. Provide products supplied by Chuck Eastridge Engraved Plastic Signs, or approved equal.

B. Epoxy Gel (260553.E05).

1. Shall be a two component, 100 % solids, moisture tolerant, high modulus, high strength, structural epoxy paste adhesive.

2. Provide Sika type Sikadur 31, Hi-Mod Gel, or approved equal.

C. Conductor and Cable Identification Sleeves (260553.T31).

1. The identification sleeves shall be properly sized for the cable or conductor.

2. Sleeves shall be white with black machine generated characters.

3. Provide Brady wire and cable sleeves, or approved equal.

D. Flexible Identification Tape (260553.T56).

1. Shall be white, red, yellow, clear or as otherwise specified tape with black characters.

2. Standard tape size shall be 0.5 inch high unless specified otherwise and shall have extra strength adhesive rated for indoor and outdoor use.

3. Provide products manufactured by Brother, or approved equal.

E. Colored Tape (260553.T73).

1. Shall be two (2) inches wide nominal and available in the colors specified.

2. Shall have extra strength adhesive rated for indoor and outdoor use.

3. Color code for tape shall be as listed below.

a. IT Data/Phone – BLUE

4. Provide DUCK, 3M, or approved equal.

F. Arc Flash Labels (260553.A11).

1. Shall be self adhesive and manufactured specifically for this purpose.
2. Shall be four (4) inches high by six (6) inches wide minimum.
3. Shall be based on the latest edition requirements of the National Fire Protection Association (NFPA) 70E – Standard for Electrical Safety.
4. At a minimum the label shall contain the following information.
    a. Date calculation was performed and who did the calculation.
    b. Danger or Warning level based on the incident energy. When above 40 cal/cm sq. the label shall read “Danger”.
    c. Shall identify the hazard as being both arc flash and shock hazard.
    d. Shall clearly state the incident energy and the level of personal protective equipment (PPE) required.
    e. Provide labels manufactured by Dura Label, SKM System Analysis, Inc., or approved equal.

G. Conductor Color Coding (260553.C89).

1. Conductors shall be colored as specified in the table below. The technical specification requirements for the conductors are specified elsewhere.

Conductor Color Coding

System	Conductor	Color
All Systems	Equipment Grounding	Green
IT / Data	Data Cable Sheath (outer cover)	Blue
24 Volt DC	Positive	Blue
	Negative	White w/ Blue Stripe
	Discrete Input Line (hot leg) Side	Blue
	Discrete Input Switch Leg	Blue w/ White Stripe
	Discrete Output Line (hot leg) Side	Blue
	Discrete Output Switch Leg	Blue w/ Orange Stripe
24 Volt AC	Hot Leg	Red
	Neutral	White
	Discrete Input Line (hot leg) Side	Red
	Discrete Input Switch Leg	Red w/ Blue Stripe
120 Volt AC Control	Hot Leg	Red
	Neutral	White
	Discrete Input Line (hot leg) Side	Red
	Discrete Input Switch Leg	Red w/ White Stripe
	Discrete Output Line (hot leg) Side	Red
	Discrete Output Switch Leg	Red w/ Orange Stripe
120/240 Volt Single Phase	Hot Leg # 1	Black
	Hot Leg # 2	Red
	Neutral	White
120/208 Volt Three Phase	Phase A	Black
	Phase B	Red
	Phase C	Blue
	Neutral	White
120, 208, 277 Volt	Switch Legs	Pink
480 Volt Three Phase	Phase A	Brown
Wye or Delta Corner Tap	Phase B	Purple
	Phase C	Yellow
	Neutral	Gray
120/240 Delta Three Phase	Phase A	Brown
	Phase B	Orange
	Phase C	Yellow
	Neutral	Gray

PART 3 - EXECUTION

3.01 INSTALLATION

A. Plastic Nameplates

1. Provide plastic nameplates for panelboards, motor control centers, motor starters, disconnects, variable frequency drives, control panels and similar equipment. The verbiage on the nameplate shall be as identified on the Contract Drawings. The CONTRACTOR shall request the required verbiage from the ENGINEER should it not be available on the Contract Drawings.

2. In addition to the nameplate identifying the equipment, a second nameplate shall be provided that identifies the source of power for the equipment i.e. “Fed From PNL208-1”.

3. Typically the nameplates shall be centered and installed near the top of the equipment.

4. Nameplates shall be black with white characters unless specified otherwise.

5. Nameplates on emergency panels shall be red with white characters.

B. Conductor and Cable Identification Sleeves

1. Provide heat shrink, machine generated, white labels with black characters for all cables and conductors. Explanation is provided below on how various systems shall be identified. In many cases the information necessary to develop the unique identification labels will be provided on the Contract Drawings. The verbiage required for the identification shall be as identified on the Contract Drawings. The CONTRACTOR shall request the required verbiage from the ENGINEER should it not be available or clear based on the information provided on the Contract Drawings.

2. The labels shall be installed between 6 to 8 inches from the end and shrunk. Conductors shall be labeled at all splices and points of termination.

3. Power conductors and cables, including the neutral and the ground conductors shall all be identified individually. The identification label will be developed as follows: The first set of characters will be the equipment code identifying the source of power “PNL208” followed by the circuit number “CKT 12” and a forward slash followed by the room number where the utilization is located and then the utilization equipment. Using the first sequential unit heater in room 2334 as an example, the label would read “PNL208-CKT 12/ 2334-UH-1”.

4. Control conductors, including grounds, shields, etc. shall be identified individually. The label shall identify the point of origin and the utilization equipment it serves. The identification label will be developed as follows: An sample label for a conductor fed from terminal strip 2, terminal block 33 in control panel # 1 (CP-1) to an terminal strip 1, terminal block 4 in automatic transfer switch # 1 (ATS-1) would read CP-1 TS2-TB33 / ATS-1 TS1-TB4.

5. Local Area Network (LAN) cables shall be identified with the rod mount number, highband number and the network room number from which it is connected. The verbiage required for the identification shall be as identified on the Contract

Drawings. The CONTRACTOR shall request the required verbiage from the ENGINEER should it not be available or clear based on the information provided on the Contract Drawings.

C. Colored Tape

1. Colored tape shall be installed on conduits used for the systems listed below. The tape shall have extra strength adhesive rated for indoor and outdoor use and two (2) inches wide. CONTRACTOR shall install a single wrap around the circumference of the conduit at five (5) foot intervals. In addition the exterior of junction or pull boxes installed along these raceways shall be painted entirely with 2 coats of paint that matches the tape color.

   a. Data / IT – BLUE

D. Arc Flash Labels

1. The CONTRACTOR shall install arc flash labels on all electrical equipment as required by the NEC and National Fire Protection Association (NFPA) 70E – Standard for Electrical Safety. The minimum requirements for the labels are itemized in PART 2 Products.

2. The CONTRACTOR shall be responsible for providing the coordination study and arc flash analysis necessary to calculate the incident energy and personal protective equipment (PPE) data required on each label.

3. An as-built coordination study and arc flash analysis shall be prepared at the Contractor's expense and be performed by a Professional Engineering licensed in the State of Oregon. The calculations shall utilize SKM Power Tools software and an electronic and hard copy shall be submitted to the Owner for approval. Arc Flash Labels with all data specified by the current edition of the NFPA 70E (Standard for Electrical Safety) and Occupational Safety & Health Administration (OSHA) shall be provided by the Contractor.

4. The CONTRACTOR is responsible to make the adjustments to the protective devices and circuit breakers as specified in the coordination study.

END OF SECTION

SECTION 26 24 13

SWITCHBOARDS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes

1. This section includes requirements for Low Voltage Switchboards.

B. The Switchboards listed on this project shall be coordinated with the OWNER and the OWNER's System Integrator to install the switchboards at the locations identified on the Drawings.

C. Switchboards listed on the project include the following:

Item	Description
Switchboard SMSB-1	Service Entrance Rated Main Service Switchboard w/ Power Monitor
Switchboard MSB-1	Main Distribution Switchboard

1.02 REFERENCES

A. The following is a list of Standards that may be referenced in the Section.

1. NEMA Standard PB 2 Deadfront Distribution Switchboards.

2. Underwriters' Laboratories (UL) Standard No. UL 891 Switchboards.

3. ANSI C37.90, Standard Relays and Relay Systems Associated with Electric Power Apparatus.

4. National Electrical Code (NEC).

1.03 SUBMITTALS

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

B. Submittal Format:

1. The product data shall be provided as individual PDFs for each Section, unless otherwise noted for specific items. Each PDF shall be numbered to match the specification Section numbers. Submittals not itemized and labeled as specified will be rejected as incomplete.

2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260000.A01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.

3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

4. Submittals in PDF shall include an index, table of contents, or bookmarks with hyperlinks to the associated page of all submitted items. Index shall include each product specified with their corresponding Reference Keynote Number. Electronic submittals not containing a linked index, table of contents, or bookmarks will be rejected as incomplete.

C. Product Data

1. Manufacturer's data including materials of construction, methods of installation and related information for each item specified in PART 2 PRODUCTS.

D. Shop Drawings

1. Equipment shop drawings showing elevation and plan views, compartment arrangement, conduit entry/exit locations, dimensions, weight, shipping splits and metering layouts.

2. Single line diagrams, point to point compartment wiring diagrams for metering, relay and control circuits. Show wire and terminal numbers.

3. Product data sheets and catalog numbers for circuit breakers and fused switches. List all options, trip adjustments and accessories furnished specifically for this project.

4. Itemized bill of material for metering, protective relays, accessories and control equipment.

1.04 QUALITY ASSURANCE

A. The equipment furnished under this Section shall be the product of a manufacturer who has produced this same type of equipment for a period of at least 10 consecutive years.

B. The switchboard shall be designed, assembled and tested by the manufacturer of the circuit protective devices used in the switchboard.

1.05 DELIVERY, STORAGE, HANDLING

A. Equipment Handling

1. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.06 WARRANTY

A. Provide Manufacturer's extended 24-month warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Switchboard shall be manufactured by Siemens, Eaton Corporation/Cutler-Hammer, or approved equal.

B. The Main Distribution Switchboard MSB-1 shall be at maximum: 194”W x 38”D. Switchboards which exceed these dimensions shall not be acceptable.

2.02 MANUFACTURED UNITS

A. Contractor shall refer to the Drawings for all switchboard voltage, phase, and wire ratings. All switchboards shall be rated for 60 Hz.

B. The switchboard and protective devices shall be fully rated for a short circuit current of 65k rms symmetrical amperes. Systems employing series connected ratings shall not be used. Main and feeder devices shall be coordinated for selective tripping.

C. The manufacturer shall design the switchboard, including devices, for continuous operation at its rated current in a 40 degree C ambient temperature.

D. Switchboards shall be UL listed and shall be bottom fed.

E. Service entrance rated switchboards shall be provided with a utility pull section that is a minimum of 30 inches wide and 42 inches from the ground to the bottom of the secondary bus for C.T.s. The pulling/metering section shall meet the requirements of the local power company. Provide service entrance label and provide necessary applicable service entrance features per NEC and local Code requirements.

1. Switchboards identified as “service entrance rated” shall be labeled as suitable for use as service equipment.

F. Structure

1. Switchboards shall be free standing, non-compartmentalized, front accessible, and rear aligned. Units shall be completely metal enclosed. Switchboard shall consist of the required number of vertical sections bolted together to form a rigid assembly.

a. Switchboards located indoors shall be indoor type, NEMA 1.

b. Switchboards located outdoors shall be painted steel, NEMA 3R.

2. Switchboard shall be service entrance rated where shown on the Drawings.

3. Separate vertical compartments shall be provided for all main and branch circuit protective devices and metering equipment. Feeder devices shall be group mounted and front removable.

4. Provide an EUSERC cabinet utility pull section that shall meet the requirements of the local electric utility. The EUSERC section shall be integral to the switchboard. Reference the Drawings for more details. The service section shall include:

a. Main lugs mounted for use with an underground pull section. Lug size shall be as shown on the Drawings.

b. A metering and current transformer compartment with busing for utility bar type current transformers and two (2) 15 inch (381.0 mm) high meter compartment doors – one with meter socket provisions and one blank

c. Provide underground pull sections with lug landing kit. Provide studs for incoming cables per utility company requirements as required by the utility company.

5. Cable compartments shall be code gauge steel, bolted to 12-gauge frame structure members. Doors shall be flush, hinged, with screw fasteners.

6. Ventilating louvers shall be provided to limit the temperature rise of current carrying parts. All openings shall be protected against entrance of falling dirt, water, or foreign matter.

7. The assembly shall be provided with adequate lifting means.

8. Compartments shown in the Contract Documents as "SPACE" shall be furnished with all hardware necessary for the future addition of a protective device as noted. The equipment shall include but not necessarily be limited to compartment door, barriers, plug in assembly, line and load bus stubs, etc.

9. All metal surfaces shall be chemically cleaned and primed. The finishing coat of paint shall be ANSI Z55.1 No. 61, light gray enamel.

G. Buses

1. All buses shall be silver plated copper. Neutral bus shall be 100% rated.

2. Main horizontal bus bars shall be mounted with all three phases arranged in the same vertical plane. Bus sizing shall be based on NEMA standard temperature rise criteria of 65 degrees C over a 40 degrees C ambient (outside the enclosure).

3. Buses shall be braced for the specified equipment short circuit current rating.

4. All joint connections shall be welded or shall be joined with bolts and Belleville washers.

5. Provide a copper ground bus extending throughout the entire length of the switchboard, equipped with lugs for external ground connections, sized for cables shown in the Contract Documents.

6. Unused spaces, or spaces indicated for future devices shall include doors, bus, device supports or mounting plates and connections.

H. Main Circuit Protective Device

1. Circuit breakers shall be molded case with inverse time and instantaneous tripping characteristics.

2. Circuit breakers shall be operated by a toggle-type handle and shall have a quick-make, quick-break over-center switching mechanism that is mechanically trip-free. Automatic tripping of the breaker shall be clearly indicated by the handle position. Contacts shall be non-welding silver allow and arc extinction shall be accomplished by means of DE-ION arc chutes. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism.

3. Circuits shall have a minimum symmetrical interrupting capacity as indicated on the Drawings.

4. Main breaker shall be molded case with electronic trip units, ratings as shown on the Drawings.

I. Feeder Protective Devices

1. Feeder protective devices shall be molded case with electronic trip units ratings as shown on the Drawings.

J. Electronic Trip Units

1. Each molded case circuit breaker microprocessor-based tripping system shall consist of three (3) current sensors, a trip unit and a flux-transfer shunt trip. The trip unit shall use microprocessor-based technology to provide the adjustable time-current protection functions. True RMS sensing circuit protection shall be achieved by analyzing the secondary current signals received from the circuit breaker current sensors, and initiating trip signals to the circuit breaker trip actuators when predetermined trip levels and time-delay settings are reached.

2. An adjustable trip setting dial mounted on the front of the trip unit shall establish the continuous trip ratings of each circuit breaker. Rating plugs shall be adjustable and settings shall be adjusted by the CONTRACTOR as indicated on the Drawings. Rating plugs shall be interlocked so they are not interchangeable between frames, and interlocked such that a breaker cannot be closed and latched with the rating plug removed.

3. System coordination shall be provided by the following microprocessor-based time-current curve shaping adjustments:

a. Adjustable long-time setting (set by adjusting the trip setting dial).

b. Adjustable short-time setting and delay with selective curve shaping.

c. Adjustable instantaneous setting.

d. Adjustable ground fault setting and delay (where shown on the Drawings).

e. The microprocessor-based trip unit shall have both powered and unpowered thermal memory to provide protection against cumulative overheating should a number of overload conditions occur in quick succession.

f. When the adjustable instantaneous setting is omitted, the trip unit shall be provided with an instantaneous override.

g. Where internal ground fault protection is specified, adjustable settings shall not exceed 1200 amperes. Provide neutral ground fault sensor for four-wire loads.

h. Where continuous current rating of the protective device is rated or can be adjusted to 1200 amperes or higher, the electronic trip unit shall be provided with a arc flash energy-reducing maintenance mode capability.

i. Breakers shall have built-in test points for testing the long-time delay, instantaneous, and ground fault functions of the breaker by means of a test set.

K. Digital Metering Power Monitor (PM)

1. Provide a digital metering module (PM) for the service entrance switchboard main feeder as shown in the Contract Documents.

2. The PM shall be a microprocessor based, solid state unit suitable for door mounting on the electrical equipment enclosure and for providing monitoring for the 3 phase electrical circuits detailed in the Contract Documents. The PM shall be UL-listed and comply with applicable portions of ANSI C37.90.

3. The PM shall provide direct reading of metered or calculated values for the items listed below and shall automatically range between Units, Kilo-units, and Mega-units for all displayed values. Accuracy's indicated shall be of read or calculated values.

   a. AC amperes in each phase: 1 percent accuracy.

   b. AC voltage, phase-to-phase and phase-to-neutral: 1 percent accuracy.

   c. Kilowatts: 2 percent accuracy.

   d. Kilovars: 2 percent accuracy.

   e. Power factor: 4 percent accuracy.

   f. Frequency: 0.5 percent accuracy.

   g. Kilowatt demand (5, 10, 15, 30 minutes interval programmable): 2 percent accuracy.

   h. Kilowatt hours: 2 percent accuracy.

   i. Kilovar hours: 2 percent accuracy.

   j. KVA: 2 percent accuracy.

   k. KVAH: 2 percent accuracy.

   l. Percent TDD.

   m. Percent THD.

   n. K factor.

4. External current transformers with ratios as indicated on the drawing or as required shall be provided.

5. The PM shall not utilize voltages greater than 120 VAC on the equipment enclosure door. This may be accomplished by back pan mounting of the voltage input sensors and door mounting the display portion of the PM or with the use of separate (and fused) potential transformers. Integral potential transformers shall be fused.

6. The PM shall have a dedicated communication port configured for Ethernet / IP communication via the OWNER's SCADA system. Configure PM to transmit all variables on the SCADA system. Coordinate PM address with the OWNER's System Integrator for each PM provided.

7. The PM display face shall be membrane type and rated suitable for NEMA 12 mounting and integrated into the switchboard enclosure. The device shall have a durable, LED display screen accessible to the user without requiring opening a switchboard door.

8. The PM shall have an operating temperature range of 0 degrees C to 70 degrees C, and 0 to 95 percent relative humidity non-condensing.

9. The PM shall allow the user to disable undesired values/functions and to later reactivate them if required.

10. Control power shall be drawn from the monitored incoming AC line terminal connections. No separate AC supply input shall be required.

11. The device shall have non-volatile memory and not require battery backup; in the event of a power failure, the device shall retain all pre-set parameters, accumulated watt-hours, watt demand. Data at time of power loss shall be stored.

12. PM shall include a shorting terminal block in the CT secondary circuit.

13. The PM shall be Allen Bradley, PM-5000 or approved equal.

L. Surge Protection Device (SPD)

1. Provide a surge suppression device (SPD) as shown on the Drawings.

2. The SPDs shall incorporate thermally protected metal-oxide varistors (MOVs) as the core surge suppression component for the service entrance and all other distribution levels. The system shall not utilize silicon avalanche diodes, selenium cells, air gaps, or other components that may crowbar the system voltage leading to system upset or create any environmental hazards.

3. The Maximum Continuous Operating Voltage (MCOV) of the SPDs shall not be less than 115% of the nominal system operating voltage.

4. The SPDs shall provide line-to-line and line-to-ground protection.

5. The Nominal Discharge Current rating of the SPDs shall be 20kA.

6. The maximum Voltage Protection Rating of the SPDs shall not exceed 2,000.

7. The SPDs shall be provided with the following integral mounting options:

8. Protection Status Indicators - Each unit shall have a green / red solid-state indicator light that reports the status of the protection on each phase.

9. The indicator lights shall report the status of all protection elements and circuitry in the L-G and L-L modes.

10. The absence of a green light and the presence of a red light shall indicate that damage has occurred on the respective phase or mode. All protection status indicators shall indicate the actual status of the protection on each phase or mode. If power is removed from any one phase, the indicator lights shall continue to indicate the status of the protection on all other phases and protection modes. Diagnostics packages that simply indicate whether power is present on a particular phase shall not be accepted

11. The SPD shall include Form C dry contacts (one NO and one NC) for remote annunciation of its status. Both the NO and NC contacts shall change state under any fault condition.

12. The SPD shall contain an audible alarm that will be activated under any fault condition. There shall also be an audible alarm silence button used to silence the audible alarm after it has been activated.

13. The SPD shall be equipped with an LCD display that indicates to the user how many surges have occurred at the location. The surge counter shall trigger each time a surge event with a peak current magnitude of a minimum of 50 ± 20A occurs. A reset pushbutton shall also be standard, allowing the surge counter to be zeroed. The reset button shall contain a mechanism to prevent accidental resetting of the counter via a single, short-duration button press. In order to prevent accidental resetting, the surge counter reset button shall be depressed for a minimum of 2 seconds in order to clear the surge count total.

14. The ongoing surge count shall be stored in non-volatile memory. If power to the SPD is completely interrupted, the ongoing count indicated on the surge counter's display prior to the interruption shall be stored in non-volatile memory and displayed after power is restored. The surge counter's memory shall not require a backup battery in order to achieve this functionality.

15. The unit shall contain thermally protected MOVs. These thermally protected MOVs shall have a thermal protection element packaged together with the MOV in order to achieve overcurrent protection of the MOV. The thermal protection element shall disconnect the MOV(s) from the system in a fail-safe manner should a condition occur that would cause them to enter a thermal runaway condition.

16. All of the SPD's components and diagnostics shall be contained within one discrete assembly.

17. The minimum surge current withstand capacity of the SPD shall be as follows:

18. 250kA per phase.

19. 125kA per mode.

20. The SPDs shall be mounted within the switchboard enclosure. Externally mounted SPDs shall not be acceptable.

21. The SPDs shall be provided with a circuit breaker disconnect.

M. Wiring

1. Low voltage instrument and control wiring shall be copper, Type SIS, flameproof switchboard wire identified with shrink on marker sleeves at each end. Low voltage wiring terminal blocks shall have marking strips and shall be mounted vertically in an accessible location. All terminal lugs shall be of the full loop type.

N. Marking and Identification

1. In conformance with Section 26 05 53.

2. A manufacturer's plaque shall be fastened to the front of the switchboard. The plaque shall indicate model number, serial number, amperes, volts, short circuit rating, etc.

3. The switchboard shall be furnished with a sign marked "DANGER 480 VOLTS KEEP OUT". Letters shall be not less than 1 in high, 1/4 in stroke. Signs shall be adhesive backed mylar and OSHA approved.

4. Mimic Bus: Provide an approved mimic bus on front of each switchboard assembly. Color shall be black for the Normal Power system and red for the Essential Electrical System, either factory-painted plastic or metal strips. Plastic tape shall not be used. Use symbols similar to one line diagram shown on drawings. Plastic or metal strips shall be mounted with plated screws.

2.03 SEISMIC BRACING

A. The Manufacturer shall provide a seismic certificate.

2.04 SPARE PARTS AND ADDITIONAL MATERIALS

A. Provide the following spare parts in the quantities specified:

1. One dozen each of cover bolts, spring nuts and door fasteners.

2. One quart of touch up paint.

B. Spare parts shall be boxed or packaged for long term storage and clearly identified on the exterior of package. Identify each item with manufacturers name, description and part number.

PART 3 - EXECUTION

3.01 MANUFACTURER'S SERVICES

A. An authorized representative of the manufacturer shall provide on-site start-up and commissioning of the switchboards and power meter. Provide at minimum eight hours of on-site commissioning and four hours on site OWNER training.

B. Provide a signed certificate stating the installation meets or exceed the manufacturer's installation standards and instructions.

C. Verification that the switchboard is operating as specified.

D. Provide a printout of all as-commissioned adjustable set points for future reference.

END OF SECTION

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SECTION 26 32 00

PACKAGED DIESEL GENERATOR ASSEMBLIES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes.
   1. Requirements for a complete factory assembled generator set with digital electronic generator controls, and digital voltage regulator.
   2. The generator and transfer switch shall be of the same manufacturer.
   3. Requirements for an outdoor weather-protective enclosure.
   4. Requirements for a sub-base fuel tank.

1.02 REFERENCES

A. The following is a list of Codes and Standards that the packaged diesel generator shall conform to. The generator set shall include necessary features to meet the requirements of these standards.
   1. IEEE 446 – Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
   2. NFPA 70 – National Electrical Code
   3. NFPA 99 – Essential Electrical Systems for Health Care Facilities, if applicable to this project.
   4. NFPA 110 – Emergency and Standby Power Systems, if applicable to this project.
   5. NEMA MG1. Alternator shall comply with the requirements of the current edition of this Standard as they apply to AC alternators.
   6. UL 142 – Sub-base Tanks.
   7. UL 1236 – Battery Chargers.
   8. UL 2200 – The generator set shall be list to UL2200.

B. The generator control system shall comply with the following Codes and Standards.
   1. EN 50082-2, Electromagnetic Compatibility, Generic Immunity Requirements, Part 2.
   2. EN 55011, Limits and Methods of Measurement of Radio Interference Characteristics.
   3. FCC Part 15, Subpart B.
   4. IEC 8528 Part 4. Control Systems for Generator Sets.
   5. IEC Std. 801.2, 801.3 and 801.5 for susceptibility, conducted and radiated electromagnetic emissions.
   6. UL 508. The entire control system of the generator set shall be UL 508 listed and labeled.

C. The generator set manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying assurance in design/development, production, installation and service in accordance with ISO 9001.

1.03 SUBMITTALS

A. Contractor shall submit all the product data in Division 26 at the same time. Piecemeal submittals will be rejected as incomplete.

A. Submittal Format:
   1. The product data shall be provided as individual PDFs for each Section, unless otherwise noted for specific items. Each PDF shall be numbered to match the specification Section numbers. Submittals not itemized and labeled as specified will be rejected as incomplete.
   2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260000.A01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
   3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.
   4. Submittals in PDF shall include an index, table of contents, or bookmarks with hyperlinks to the associated page of all submitted items. Index shall include each product specified with their corresponding Reference Keynote Number. Electronic submittals not containing a linked index, table of contents, or bookmarks will be rejected as incomplete.

B. Product Data
   1. Pursuant to Section 01 33 00 – Submittal Procedures.
   2. Manufacturer's data including materials of construction, methods of installation and related information for each item specified in PART 2 PRODUCTS.

1. Provide a complete bill of materials. Any differences between products specified and proposed shall be clearly identified.
2. Manufacturer's product literature, model specifications and performance data sufficient to verify compliance with items specified in 1.2 References of this Section.
3. Complete model number and trip characteristics for the main circuit breaker to be provided.
4. Warranty information complying with the requirements of this Section.
5. Seismic certification for area installed provided by the manufacturer.
6. Seismic calculations for the concrete slab and anchor bolts required. Calculations shall be wet stamped by a Professional Engineer licensed in the State of Oregon.
7. Project specific power and control schematic. The schematic shall clearly identify all field wiring termination points using the same identification shown in the Contract Documents.
8. The generator, fuel tank and battery charger shall, at a minimum have the following I/O points identified on the schematic.
   a. Generator H-O-A in hand.
   b. Generator H-O-A in auto.
   c. Generator running.

d. Generator warning.
e. Generator failed.
f. Generator low fuel.
g. Battery charger failed.

9. Submittal shall include a line by line compliance statement based on this specification.
10. Manufacturer's document of EPA certification for proposed model generator.
11. Outline drawing showing overall dimensions of generator, tank, enclosure and accessories.

1.04 QUALITY ASSURANCE

A. Qualifications.
1. The manufacturer of this equipment shall have produced similar equipment for a minimum period of ten years. When requested by the ENGINEER, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.
2. The generator shall be of the same manufacturer as the transfer switch to provide a single source of warranty responsibility for all the products provided.
3. Generator set manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation and service in accordance with ISO 9001.

B. Factory Testing.
1. The generator set manufacturer shall perform a complete operational test on the generator set prior to shipping from the factory. A certified test report shall be shipped with the generator set.
2. Generator set factory tests on the equipment shall be performed at rated load and rated power factor. Generator sets that have not been factory tested at rated power factor will not be acceptable. Tests shall include; run at full load, maximum power, voltage regulation, transient and steady-state governing, single step load pickup and function of safety shutdowns.
3. Factory testing may be witnessed by the OWNER and/or ENGINEER. Costs for travel expenses will be the responsibility of the OWNER and/or ENGINEER. Manufacturer is responsible to provide a minimum of two weeks notice for factory testing.

1.05 WARRANTY

A. Generator set, fuels tank, enclosure and accessories specified within this Section shall be warranted for a minimum period of 5 years from the date of substantial completion against all defects in materials and workmanship. The warranty shall be comprehensive including all parts, labor and travel.

1.06 Selective Coordination

A. The manufacturer of the generator and overcurrent protection device has been designed to Selectively Coordinate to the maximum extent possible:
   1. The basis of design is the Cummins Amp Sentry Relay. Alternate overcurrent protection devices shall meet or exceed the adjustable trip characteristics of the Amp Sentry Relay.

PART 2 PRODUCTS

2.01 GENERATOR SET (263200.G01).

A. Manufacturer
   1. Basis of design shall be Cummins or approved equal.

B. Ratings.
   1. The generator set shall operate at a voltage as shown on the Drawings.
   2. The generator set shall be rated as shown on the Drawings. Standby rating, based on site conditions of an altitude of 500 feet above sea level and ambient temperatures up to 104 degrees F.

C. Performance.
   1. Voltage regulation shall be plus or minus 0.5 % for any constant load between no load and rated load. Random voltage variation with any steady load from no load to full load shall not exceed plus or minus 0.5 %.
   2. Frequency regulation shall be isochronous from steady state no load to steady state rated load. Random frequency variation with steady state no load to steady state rated load shall not exceed plus or minus 0.5%.
   3. The diesel engine generator set shall accept a single step load of 100 % nameplate kW and power factor, less applicable de-rating factors, with the engine generator set at operating temperature.
   4. Motor starting capability shall be 4,725kVA at 125-degrees C. The alternator shall be rated for a maximum of 1,150kVA at 125-degrees C. The generator set shall be capable of recovering to a minimum of 90 % of rated no load voltage following the application of the specified kVA load at near zero power factor applied to the generator set. Maximum voltage dip on application of this load, considering both alternator performance and engine speed changes shall not exceed 25 %. The maximum frequency dip shall not exceed 8%.
   5. The alternator shall produce a clean AC voltage waveform, with no more than 5 % total harmonic distortion at full linear load when measured from line to neutral, and no more than 3 % in any single harmonic and no third order harmonics or their multiples. Telephone influence factor shall be less than 40.
   6. The generator set shall be certified by the engine manufacturer to be suitable for use at the installed location and rating and shall meet all applicable exhaust emission requirements at the time of commissioning.

D. Construction.

1. The engine generator set shall be mounted on a heavy duty steel base to maintain alignment between components. Provide vibration isolators between the engine generator assembly and the structural base. The base shall incorporate a battery tray with hold down clamps within the rails.

2.02 ENGINE AND ENGINE EQUIPMENT

A. The engine shall be diesel, 4 cycle, radiator and liquid cooled, producing 1.5 HP per kW to operate at 1800 rpm for full electrical output rating. The horsepower rating of the engine at its minimum tolerance level shall be sufficient to drive the alternator and all connected accessories.

B. An electronic governor system shall provide automatic isochronous frequency regulation. The governing system dynamic capabilities shall be controlled as a function of the engine coolant temperature to provide fast stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate and excitation as appropriate to the state of the generator set. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed and accelerating to rated speed.

C. Skid mounted radiator and cooling system rated for the full load operation in 122 degrees F ambient as measured at the alternator air inlet. Radiator shall be prototype tested to verify cooling performance of the engine, radiator and fan operation in a controlled environment. Radiator shall be provided with a duct adapter flange if generator is to be installed indoors. The equipment manufacturer shall fill the cooling system with a 50/50 ethylene glycol / water mixture prior to shipping. Rotating parts shall be guarded against accidental contact.

D. Electric starter(s) capable of three complete cranking cycles without overheating.

E. Provide with full flow lubrication oil filters with replaceable spin on canister elements.

F. An engine driven, mechanical, positive displacement fuel pump. Provide fuel filter with replaceable spin on canister element. Fuel cooler if required for operation due to the design of the engine and the installation.

G. Provide replaceable dry element air cleaner with restriction indicator.

H. Engine battery charging alternator, 40 ampere minimum and solid state voltage regulator.

I. Flexible supply and return fuel lines.

2.03 AC ALTERNATOR

A. The AC generator shall be; synchronous, four pole, 2/3 pitch, revolving field, drip proof construction, single pre-lubricated sealed bearing, air cooled by a direct drive centrifugal blower fan and directly connected to the engine with flexible drive disc. All insulation system components shall meet NEMA MG1 temperature limits for Class H insulation system and shall be UL 1446 listed. Actual temperature rise measured by resistance method at full load shall not exceed 105 degrees C.

B. A permanent magnet generator (PMG) shall be included to provide a reliable source of excitation power for optimum motor starting and short circuit performance. The PMG and controls shall be capable of providing sufficient excitation for the alternator to supply approximately 300 % of rated current for up to 10 seconds.

2.04 GENERATOR SET CONTROL

A. The generator set shall be provided with a microprocessor based control system that is designed to provide automatic starting, monitoring, protection and control functions for the generator set. The control system shall also be designed to allow local monitoring and control of the generator set and remote monitoring and control as described in the specification.

B. The control shall be mounted on the generator set. The control shall be vibration isolated and prototype tested to verify the durability of all the components in the system under the vibration conditions encountered. All switches, lamps and meters in the control system shall be oil-tight and dust-tight. All active control components shall be installed within a UL/NEMA 3R enclosure. There shall be no exposed points in the control, with the door open, that operate in excess of 50 volts.

C. The generator control enclosure which contains all operator interface switches, lamps, emergency stop switch and accessories listed below, shall be mounted no more that seventy-five (75) inches to the top, above finished floor after the generator set has been installed on a belly tank, isolation springs or other devices specified herein and/or shown on the Drawings.

D. The generator set controller shall be capable of communicating via Ethernet/IP with the OWNER's SCADA system. The following alarms shall be monitored via Ethernet/IP by the SCADA system:
   1. Generator H-O-A in hand.
   2. Generator H-O-A in auto.
   3. Generator running.
   4. Generator warning.
   5. Generator failed.
   6. Generator low fuel.
   7. Battery charger failed.

E. Requirements for control switches are listed below.
   1. Mode select switch. The mode select switch shall initiate the following control modes. When in the run or manual position the generator set shall start and accelerate to rated speed and voltage as directed by the operator. A separate pushbutton to initiate starting is acceptable. In the off position the generator set shall immediately stop bypassing all time delays. In the auto position the generator set shall be ready to accept a signal from a remote device to start and accelerate to rated speed and voltage.
   2. Emergency stop switch. Switch shall be red mushroom-head pushbutton. Depressing the emergency stop switch shall cause the generator set to immediately shut down and be locked out from automatic restarting.
   3. Reset switch. The reset switch shall be used to clear a fault and allow restarting the generator set after it has shut down for any fault condition.

4. Panel lamp switch. Depressing the panel lamp switch shall cause the entire panel to be lighted with DC control power. The panel lamps shall automatically be switched off 10 minutes after the switch is depressed or after the switch is depressed a second time.
5. Voltage and frequency adjustment. The generator set control shall include digital raise / lower switches for adjustment of voltage and frequency.

F. Generator Set AC Output Metering.
1. The generator set shall be provided with a metering set including the following features and functions.
    a. Digital metering set, 1 % accuracy to indicate generator RMS voltage and current, frequency and total load on the generator set.
    b. Generator set alarm and status display.

G. Generator Set Alarm Status Display.
1. The generator set control shall include LED alarm and status indication lamps. The lamps shall be high intensity LED type. The lamp condition shall be clearly apparent under bright room lighting conditions. At a minimum, the control shall have separate indication lamps to indicate the following.
    a. Not in Auto.
    b. Shutdown.
    c. Warning.
    d. Remote Start.
    e. Auto mode.
    f. Manual run.
2. The generator set control shall indicate the existence of warning and shutdown conditions on the generator set control panel for all the following conditions.
    a. Low oil pressure (warning and shutdown).
    b. High coolant temperature (warning and shutdown).
    c. Over current (warning and shutdown).
    d. Oil pressure sender failure (warning).
    e. Low coolant temperature (warning).
    f. Low and high battery voltage (warning).
    g. Weak battery (warning).
    h. Low fuel level (warning).
    i. Engine temperature sender failure (warning).
    j. Low coolant level (shutdown).
    k. Fail to crank (shutdown).
    l. Fail to start/over-crank (shutdown).
    m. Over-speed (shutdown).
    n. Low and high AC voltage (shutdown).
    o. Over and under frequency (shutdown).
    p. Field overload (shutdown).
    q. Loss of sensing voltage (shutdown).
    r. Emergency stop (shutdown).
3. The control system shall incorporate data logging of alarm conditions.

4. Provisions shall be made for indication of customer specified alarm conditions as identified in 1.3 Submittals in this specification, but in no case shall there be less than a minimum of four (4) customer specified alarm or shutdown conditions.

H. Engine Status Monitoring.
   1. The following information shall be available from the alphanumeric display panel on the generator set control.
      a. Engine oil pressure.
      b. Engine coolant temperature.
      c. Engine speed (rpm).
      d. Number of hours of operation.
      e. Number of start attempts.
      f. Battery voltage.

I. Engine Control Functions.
   1. The control system shall include a cycle cranking system which allows for user selected crank time, rest time and number of cycles. Initial settings shall be for three cranking periods of fifteen seconds each with fifteen second rest period between cranking periods.
   2. The control system shall include the engine governor control which functions to provide steady state frequency regulation as noted elsewhere in this specification.
   3. The control system shall include sender failure monitoring logic which is capable of discriminating between failed sender or wiring components and an actual failure condition.
   4. The control system shall include time delay start (adjustable from 0 to 300 seconds) and time delay stop (adjustable from 0 to 600 seconds) functions.

J. Alternator Control Functions.
   1. The generator set shall include a full wave rectified automatic digital voltage regulation system that is matched and prototype tested by the engine manufacturer with the governing system provided. It shall be immune from mis-operation due to load induced voltage waveform distortion and provide pulse width modulated output to the alternator exciter. The voltage regulation system shall control buildup of AC generator voltage to provide linear rise and limit overshoot. The system shall include a torque matching characteristic which shall reduce output voltage in proportion to frequency below adjustable frequency threshold. Torque matching characteristic shall be adjustable for roll off frequency and rate and be capable of being curve matched to the engine torque curve with adjustments in the field. The voltage regulator shall include adjustments for gain, damping and frequency roll off. Adjustments shall be made via digital raise/lower switches with an alphanumeric LED readout to indicate setting level.
   2. A microprocessor based protection device shall be provided to monitor the output current of the generator set and initiate an alarm (over current warning) when load exceeds 110 % of the rated current of the generator set for more than sixty seconds. The device shall shutdown and lock out the generator set when output current approaches the thermal damage point of the alternator (over current shutdown). The protective functions provided shall be in compliance with the requirements of NFPA 70 (NEC) Article 445.
   3. The control shall provide alternator protection from the following conditions.

a. High or low voltage.
b. Over or under frequency.
c. Over current warning or shutdown.
d. Loss of voltage sensing.
e. Field overload shutdown.

4. A microprocessor based AC over / under voltage monitoring system that responds only to true RMSD voltage conditions shall be provided. The system shall initiate shutdown of the generator set when alternator output voltage exceeds 110 % of the operator set point voltage level for more than ten seconds or with no intentional delay when voltage exceeds 130 %. Under voltage shutdown shall occur when the output voltage of the alternator is less than 85 % for more than ten seconds.

2.05 Other Equipment to be Provided With the Generator Set.

A. The generator set shall be provided with an inherent alternator protection relay. The use of a molded case generator output circuit breaker shall not be acceptable.
1. The relay shall provide overload protection of the generator and generator feeder conductors, per the NEC.
2. The relay shall provide short circuit and ground fault protection.
3. The relay trip curve shall be adjustable to achieve selective coordination.
4. The relay shall selectively coordinate per the NEC and the Oregon Electrical Specialty Code.
5. The generator shall be provided with a disconnect capable of being locked in the open position. This disconnecting means shall not consist of a circuit breaker. The disconnecting means shall comply with the NEC and the Oregon Electrical Specialty Code.
6. The alternator protection shall be Cummins Amp Sentry.

B. Outdoor Weather Protective and Sound Attenuation Enclosure.
1. The generator set shall be provided with an outdoor enclosure (housing) with the entire package listed under UL 2200. Housing shall provide ample airflow for generator set operation at rated load in an ambient temperature of 100 degrees F. The housing shall have lockable hinged access doors as required to maintain easy access for all operating and service functions. Enclosure roof shall be cambered to prevent rainwater accumulation. Openings shall be screened to limit access of rodents into the enclosure.
2. The outdoor weather protective enclosure shall be made of steel.
3. The enclosure shall be insulated with non-hydroscopic materials and reduce the sound level of the generator set while operating at full rated load to a maximum of 75 dBA as measured at seven meters from the generator set in a free field environment.
4. All sheet metal shall be primed for corrosion protection and finish painted with the manufacturer's standard color using a two step electro-coating paint process. Listed below is the minimum level of performance for the painting process.
a. Primer thickness, 0.5 – 2.0 mils. Top coat thickness, 0.8 -1.2 mils.
b. Gloss, per ASTM D523-89, 80 % plus or minus 5 %. Gloss retention after one year shall exceed 50 %.
c. Cross hatch adhesion, per ASTM D3359-93, 4B-5B.
d. Impact resistance, per ASTM D2794-93, 120-160 inch pounds.

e. Salt spray, per ASTM B1117-90, 1000+ hours.
f. Humidity, per ASTM D2247-92, 1000+ hours.
g. Water soak, per ASTM D2247-92, 1000+ hours.

5. All external enclosure hardware shall be corrosion resistant and hinges shall be stainless steel.
6. A factory mounted exhaust silencer shall be mounted inside the enclosure. The exhaust shall exit the enclosure though a rain collar and terminate with a rain cap. Exhaust connections to the generator set shall be through seamless flexible connections.
7. The enclosure shall include a flexible oil drain line that extends to the exterior of the enclosure. The enclosure shall include an external radiator fill provision.

C. Provide a dual wall sub-base fuel storage tank sized to allow for full load operation of the generator set for twenty-four (24) hours at full load. The tank shall be constructed of corrosion resistant steel and shall be UL listed. The equipment, as installed by the CONTRACTOR shall meet all local and regional requirements for the application. The tank shall include all the features listed below.
1. Emergency tank and basin vents, mechanical level gauge and basin drain.
2. Fuel supply and return lines connected to generator set with flexible lines as recommended by the engine manufacturer and in compliance with UL 2200 and NFPA 37 requirements.
3. Leak detection provision and high and low fuel level float switches wired to the generator set control for local and remote alarm indication.

D. Provide a fully automatic battery charger, sized as appropriate for the engine and batteries, as recommended by the engine manufacturer. The charger shall be UL labeled for use in emergency applications and shall include all features necessary to meet NFPA 110 requirements. The charger shall be provided with remote indication of battery charger fail alarm.

E. Thermostatically controlled UL 499 listed coolant heater, sized as recommended by the engine manufacturer to warm the engine to a minimum of 104 degrees F in an ambient temperature of 40 degrees F and in compliance with NFPA 110. Voltage shall be as identified in the Drawings. Coolant heater shall have provisions to isolate the heater for replacement of the heater element without draining the coolant from the generator set.

F. Provide engine starting batteries. Starting batteries shall be lead-acid, 12 volt DC, sized as recommended by the engine manufacturer, complete with battery cables and connectors. The batteries shall be capable of three complete fifteen second cranking cycles at 40 degrees F ambient temperature when fully charged.

G. Provide a thermostatically controlled anti-condensation winding heater on the alternator, sized as recommended by the engine manufacturer. The heater shall be provided with a cord and plug end and a minimum of six feet in length which can be plugged into a receptacle provided by the CONTRACTOR.

2.06 SEISMIC BRACING

A. The Manufacturer shall provide a seismic certificate.

PART 3 EXECUTION

3.01 INSTALLATION

A. Start-up and Testing
   1. An authorized employee of the manufacturer's service division shall perform the start-up and testing services.
   2. The CONTRACTOR shall notify the ENGINEER a minimum of two weeks in advance of the start-up and testing schedule to allow for witnessing of the tests.
   3. Provide a signed certificate stating the installation meets or exceed the manufacturer's installation standards and instructions.
   4. Start-up shall include a "cold start" test.
   5. Start-up shall verify all local and remote warnings, shutdowns and alarming events are operating as specified.
   6. Perform a power failure test on the entire installed system. The test shall be conducted by opening the power supply from the utility service and observing proper operation of the system for at least thirty minutes.
   7. Reference the Start-up and Testing specification Section in the Contract Documents for a detailed check list for all processes on the project. The Contractor shall go through the check list to verify compliance and that ask the ENGINEER to witness the tests as the CONTRACTOR goes through them a second time.
   8. Coordinate start-up and testing with the transfer switch start-up.
   9. Startup shall include operating the generator set with a load bank connected and operating at full load for a minimum of four continuous hours.
   10. The CONTRACTOR is responsible to provide diesel fuel for the start-up and testing activities. After start-up and testing is completed and accepted and before substantial completion, the CONTRACTOR shall completely fill the diesel fuel tank.
   11. Verification that the generator set and associated specified components are operating as specified.
   12. Provide a printout of all as-commissioned adjustable set points for future reference.

B. Demonstration and Training.
   1. An authorized employee of the manufacturer's service division shall perform the demonstration and training services. The demonstration and training period shall last a minimum of 4 hours and shall be provided on site.
   2. The OWNER reserves the right to video tape the demonstration and training presentation for future in-house use.
   3. Provide training handouts for 10 persons.

END OF SECTION

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SECTION 26 36 23

AUTOMATIC TRANSFER SWITCH

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes.

1. Provide a complete factory assembled automatic transfer switch with field programmable digital electronic controls designed for fully automatic operation. Controls shall include surge voltage isolation, voltage sensors on all phases of both sources, AC powered operator, positive mechanical and electrical interlocking and mechanically held contacts for both sources.

2. The transfer switch and generator set shall be of the same manufacturer to provide a single source of responsibility for all the products provided. Technicians shall be specifically trained, tested and certified to support the products. Technicians shall be employed by the generator set supplier.

1.02 REFERENCES

A. The following is a list of Codes and Standards that the transfer switch shall conform to.

1. UL1008 – Transfer switch. Transfer switches and enclosures shall be UL-1008 listed as a package and labeled to be suitable for use in either optional standby or legally required emergency applications.

2. IBC2006 – Transfer switch shall be prototype tested and third party certified to comply with the requirements of the IBC group III or IV, category D/F. The equipment shall be provided with installation instructions necessary to attain installation compliance.

3. CSA 282, Emergency Electrical Power Supply for Buildings.

4. NFPA 70, National Electrical Code.

5. NFPA 99, Essential Electrical Systems for Health Care Facilities.

6. NFPA 110, Emergency and Standby Power Systems. The transfer switch shall meet all requirements for Level 1 systems.

7. IEEE 446, Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.

8. NEMA ICS 10-1993, AC Automatic Transfer Switches.

B. The transfer switch shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation and service in accordance with ISO9001.

1.03 SUBMITTALS

A. Contractor shall submit all the product data in Division 16 at the same time. Piecemeal submittals will be rejected as incomplete.

1. The product data shall be provided as individual PDFs for each Section, unless otherwise noted for specific items. Each PDF shall be numbered to match the specification Section numbers. Submittals not itemized and labeled as specified will be rejected as incomplete.

2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 16000.A01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.

3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

4. Submittals in PDF shall include an index, table of contents, or bookmarks with hyperlinks to the associated page of all submitted items. Index shall include each product specified with their corresponding Reference Keynote Number. Electronic submittals not containing a linked index, table of contents, or bookmarks will be rejected as incomplete.

B. Refer to Section 26 05 00 – Common Work Results for Electrical Submittals for additional requirements.

C. Product Data

1. Pursuant to Section 01300 – Submittal Procedures.

2. Manufacturer's data including materials of construction, methods of installation and related information for each item specified in PART 2 PRODUCTS.

3. Seismic calculations for the concrete slab and anchor bolts required. Calculations shall be wet stamped by a Professional Engineer licensed in the State of Oregon.

4. Manufacturer's data including materials of construction, equipment weight, and related information for each item specified.

5. Provide a complete bill of materials. Any differences between products specified and proposed shall be clearly identified.

6. Manufacturer's product literature, model specifications and performance data sufficient to verify compliance with items specified in 1.2 References of this Section.

7. Warranty information complying with the requirements of this Section.

8. Project specific power and control schematic. The schematic shall clearly identify all field wiring termination points using the same identification shown in the Contract Documents.

9. The automatic transfer switch shall, at a minimum have the following I/O points identified on the schematic.

   a. Generator start output.

   b. Utility power loss (source 1).

   c. ATS on utility power (source 1).

   d. ATS on Generator power (source 2).

10. Submittal shall include a line by line compliance statement based on this specification.

1.04 QUALITY ASSURANCE

A. Qualifications

1. The manufacturer of this equipment shall have produced similar equipment for a minimum period of ten years. When requested by the ENGINEER, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

2. The automatic transfer switch shall be of the same manufacturer as the generator to provide a single source of warranty responsibility for all the products provided.

3. Transfer switch manufacturer shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development, production, installation and service in accordance with ISO 9001.

B. Factory Testing.

1. The transfer switch manufacturer shall perform a complete operational test on the transfer switch prior to shipping from the factory. A certified test report shall be shipped with the transfer switch.

1.05 WARRANTY

A. Transfer switch shall be warranted for a minimum period of 5 years from the date of substantial completion against all defects in materials and workmanship. The warranty shall be comprehensive including all parts, labor and travel.

PART 2 - PRODUCTS

2.01 AUTOMATIC TRANSFER SWITCH WITH BYPASS-ISOLATION

A. Basis of Design

1. The basis of design shall be Schneider Asco 7000 Series with Bypass Isolation Contactor.

B. Design Restrictions

1. Transfer switch dimensions shall be at maximum 32” W x 72”D x 91” H. Transfer switches which exceed these dimensions shall not be acceptable.

C. Ratings

1. Transfer switch shall be rated as shown on the Drawings.

2. Transfer switch shall have bypass-isolation capabilities.

   a. Bypass switch and transfer switch shall have identical electrical ratings.

3. Each automatic transfer switch shall consist of an inherently double throw power transfer switch with a solenoid operated mechanism and a microprocessor controller to provide automatic operation. All transfer switches and controllers shall be the products of the same manufacturer.

4. The withstand rating shall be sized based on the available in-rush current of the normal power source and the generator, whichever is greater in RMS symmetrical amperes. The transfer switch UL 1008 WCR ratings for use with protective devices at installation locations under specified fault conditions.

5. Main contacts shall be rated for 600 volts AC minimum.

6. Transfer switch shall be rated to carry 100 percent of the rated current continuously in the enclosure specified, ambient temperatures of – 40 to + 60 degrees C and relative humidity up to 95 percent and altitudes up to 10,000 feet above sea level.

7. Shall comply with Level 1 equipment per NFPA 110 and shall be UL 1008 Listed.

8. Resistance to Damage by Voltage Transients:

   a. Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

9. Relay signal:

   a. Control shall include provisions for addition of a pre-transfer relay signal, adjustable from 0 to 60 seconds, to be provided if necessary for elevator operation, based on equipment provided for the project.

10. Neutral bus shall carry 100% of load.

11. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 800 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars.

12. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfer between two active power sources are not acceptable.

13. All main contacts shall be silver composition. Switches rated 800 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.

14. Switched Neutral: Where neutral conductors must be switched as shown on the plans, the ATS shall be provided with fully-rated switched neutral transfer contacts. The neutrals of the normal and emergency power sources shall be

connected together only during the transfer and retransfer operation and remain connected together until power source contacts close on the source to which the transfer is being made.

D. Transition Modes

1. Open Transition: The Open Transition Power Transfer Switch shall transfer the load in a standard, 2-position, open transition configuration to reliably transfer loads between power sources using a break-before-make approach. Loads shall transfer to the alternate source in less than 100ms.The open transition power transfer switches shall utilize a reliable, single solenoid operating mechanism. The single operator design shall prevent direct connection of both sources

2. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single-solenoid mechanism. Main operators which include overcurrent disconnect devices, linear motors or gears shall not be acceptable. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency.

3. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.

2.02 BYPASS-ISOLATION SWITCH

A. A two-way bypass-isolation switch shall provide manual bypass of the load to either source and permit isolation of the automatic transfer switch from all source and load power conductors. All bypass contacts shall be manually driven.

B. Power interconnections shall be silver-plated copper bus bar. The only field installed power connections shall be at the service and load terminals of the bypass-isolation switch. All control interwiring shall be provided with disconnect plugs.

C. Separate bypass and isolation handles shall be utilized to provide clear distinction between the functions. Handles shall be permanently affixed and operable without opening the enclosure door. Designs requiring insertion of loose operating handles or opening of the enclosure door to operate shall not be accepted.

D. Bypass to the load-carrying source shall be accomplished with no interruption of power to the load (make before break contacts). Devices which disconnect the load when bypassing shall not be accepted. The bypass handle shall have three operating modes: "Bypass to Normal," "Automatic," and "Bypass to Emergency." The operating speed of the bypass contacts shall be the same as the associated transfer switch and shall be independent of the speed at which the manual handle is operated. In the "Automatic" mode, the bypass contacts shall be out of the power circuit so that they will not be subjected to fault currents to which the system may be subjected.

E. The isolation handle shall provide three operating modes: "Connected," "Test," and "Isolate." The "Test" mode shall permit testing of the entire emergency power system, including the automatic transfer switches with no interruption of power to the load. The "Isolate" mode shall completely isolate the automatic transfer switch from all source and load power conductors. When in the "Isolate" mode, it shall be possible to completely

withdraw the automatic transfer switch for inspection or maintenance to conform to code requirements without removal of power conductors or the use of any tools.

F. When the isolation switch is in the "Test" or "Isolate" mode, the bypass switch shall function as a manual transfer switch.

2.03 TRANSFER SWITCH CONTROL

A. The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module.

B. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to + 1% of nominal voltage. Frequency sensing shall be accurate to + 0.2%. The panel shall be capable of operating over a temperature range of -20 to +60 degrees °C and storage from -55 to +85 degrees °C.

C. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance. Sensing and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance. The protective cover shall include a built-in pocket for storage of the operator’s manuals.

D. All customer connections shall be wired to a common terminal block to simplify field-wiring connections.

E. The controller shall meet or exceed the following requirements for Electromagnetic Compatibility (EMC):

1. EN 55011:1991 - Emission standard - Group 1, Class A
2. EN 50082-2:1995 - Generic immunity standard, from which:
3. EN 61000-4-2:1995 - Electrostatic discharge (ESD) immunity
4. ENV 50140:1993 - Radiated Electro-Magnetic field immunity
5. EN 61000-4-4:1995 - Electrical fast transient (EFT) immunity
6. EN 61000-4-5:1995 - Surge transient immunity
7. EN 61000-4-6:1996 - Conducted Radio-Frequency field immunity

F. Controller Display and Keypad

1. A four-line, 20-character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port. The following parameters shall only be adjustable via DIP switches on the controller:

a. Nominal line voltage and frequency

b. Single or three phase sensing

c. Operating parameter protection

d. Transfer operating mode configuration

e. (Open transition, Closed transition, or Delayed transition)

2. All controller instructions and settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

G. The following features shall be built-in to the controller, but capable of being activated through keypad programming when required by the user:

1. Provide the ability to select “commit/no commit to transfer” to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load.

2. Engine Exerciser - The controller shall provide an internal engine exerciser. The engine exerciser shall allow the user to program up to seven different exercise routines. For each routine, the user shall be able to:

a. Enable or disable the routine.

b. Enable or disable transfer of the load during routine.

c. Set the start time as follows

d. time of day

e. day of week

f. week of month (1st, 2nd, 3rd, 4th, alternate or every)

g. Set the duration of the run.

h. At the end of the specified duration the switch shall transfer the load back to normal and run the generator for the specified cool down period.

H. The following features shall be built into the controller, but capable of being activated through keypad programming:

1. Terminals shall be provided for a remote contact which closes to signal the ATS to transfer to emergency. Should the emergency source fail while connected to emergency, but the normal source is acceptable the ATS shall override the transfer command and return to the normal source.

2. Terminals shall be optionally provided for an external contact so that when they are open transfer to the Normal or Emergency source is inhibited.

3. System Status - The controller LCD display shall include a “System Status” screen which shall be readily accessible from any point in the menu by depressing the “ESC” key a maximum of two times. This screen shall display a clear description of the active operating sequence and switch position. For example:

a. Normal Failed

b. Load on Normal

c. TD Normal to Emergency

d. 2 min 15s

4. Self-Diagnostics - The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals to the controller which may be preventing load transfer commands from being completed.

5. Data Logging – The controller shall have the ability to log data and to maintain the last 99 events, even in the event of total power loss. The following events shall be time and date stamped and maintained in a non-volatile memory:

   a. Event Logging
   b. Data and time and reason for transfer normal to emergency.
   c. Data and time and reason for transfer emergency to normal.
   d. Data and time and reason for engine start.
   e. Data and time engine stopped.
   f. Data and time emergency source available.
   g. Data and time emergency source not available.
   h. Statistical Data
   i. Total number of transfers.
   j. Total number of transfers due to source failure.
   k. Total number of days controller is energized.
   l. Total number of hours both normal and emergency sources are available.

6. Ethernet Compatibility

   a. The controller shall be capable of Ethernet/IP communications.
   b. Provide 5170 Quad-Ethernet module with cable for controller and power metering and mounting hardware.

2.04 VOLTAGE, FREQUENCY AND PHASE ROTATION SETTINGS

A. Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored.

B. Minimum Standard Protection Level Metering Capabilities

Parameter	Sources	Dropout/Trip	Pickup/Reset
Undervoltage	N&E,3ϕ	70 to 98%	85 to 100%
Overvoltage	N&E,3ϕ	102 to 115%	2% below trip
Under Frequency	N&E	85 to 98%	90 to 100%
Over Frequency	N&E	102 to 110%	2% below trip
Voltage Unbalance	N&E	5 to 20%	1% below dropout

C. Repetitive accuracy of all settings shall be within ± 0.5% over an operating temperature range of -20 °C to 60 °C.

D. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access.

E. The controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. The source shall not be accepted if the phase rotation is not the preferred rotation selected (ABC or CBA).

F. Source status screens shall be provided for both normal & emergency sources to display digital readout of voltage on all 3 phases, frequency, and phase rotation.

G. The controller shall include a user selectable algorithm to prevent repeated transfer cycling to a source on an installation which experiences primary side, single phase failures on a Grounded Wye – Grounded Wye transformer which regenerates voltage when unloaded. The algorithm shall also inhibit retransfer to the normal (utility) source upon detection of a single phasing condition until a dedicated timer expires, the alternate source fails, or the normal source fails completely and is restored during this time delay period. The time delays associated with this feature shall be adjustable by the user through the controller keypad and LCD.

2.05 TIME DELAYS

A. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 24 VDC power supply.

B. A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency.

C. An adjustable time delay of 0 to 6 seconds to override momentary emergency source outage to delay all retransfer signals during initial loading of engine generator set.

D. Two-time delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One-time delay shall be for actual normal source power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable.

E. A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 60 minutes.

F. A time delay activated output signal shall also be provided to drive (an) external relay(s) for selective load disconnect control. The controller shall have the ability to activate an adjustable 0 to 5 minute time delay in any of the following modes:

1. Prior to transfer only.
2. Prior to and after transfer.
3. Normal to emergency only.
4. Emergency to normal only.
5. Normal to emergency and emergency to normal.
6. All transfer conditions or only when both sources are available.

G. All time delays shall be adjustable in 1 second increments, except the extended parallel time, which shall be adjustable in .01 second increments.

H. All time delays shall be adjustable by using the LCD display and keypad. The time delay value displayed on the LCD or remote device shall be the remaining time until the next event occurs.

2.06 ENCLOSURE

A. NEMA 1.

B. The enclosure shall provide wire bending space in compliance with the latest edition of the NEC. The cabinet door shall include a permanently mounted key type latch(es). Bolted covers or doors are not acceptable.

C. Manual operating handles shall be accessible to authorized personnel only by opening the key locking cabinet door. Transfer switches with manual operating handles and /or non-key operated switches located on the outside of the cabinet do meet this specification requirement and are not acceptable.

2.07 ACCESSORIES

A. A three position momentary-type test switch shall be provided for the test / automatic / reset modes. The test position will simulate a normal source failure. The reset position shall bypass the time delays on either transfer to emergency or retransfer to normal. Switches which require utilizing the keypad and display function or have no manual time delay bypass means are not acceptable.

B. Auxiliary contacts, rated 10 amps, 250 VAC shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact closed, when the ATS is connected to the emergency source.

C. LED indicating lights (16 mm industrial grade, type 12) shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red).

D. LED indicating lights (16 mm industrial grade, type 12) shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal and emergency sources, as determined by the voltage sensing trip and reset settings for each source.

2.08 SEISMIC CERTIFICATION

A. Provide manufacturer's seismic certification.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General.

1. All identification labeling shall be in compliance with Owner's requirements.

2. The transfer switch shall be installed per the manufacturer's instructions.

3. The transfer switch shall be installed as per the Drawings.

4. The transfer switch shall be installed per the NEC.

5. The mounting of the transfer switch shall meet or exceed the seismic requirements for the jurisdiction installed.

B. Field Quality Control

1. The local authority having jurisdiction shall approve the installation of the transfer switch and generator set before they are energized.

C. Open Transition Sequence of Operation

1. Transfer switch normally connects an energized utility power source (source 1) to loads and a generator set (source 2) to loads when the normal source fails. The normal position of the transfer switch is source 1 (connected to utility) and no start signal is supplied to the generator.

2. Generator set exercise test with load mode. The control system shall be configurable to test the generator set under load. In this mode the transfer switch shall control the generator set in the following sequence.

   a. Transfer switch shall initiate the exercise sequence at a time indicated in the exercise timer program or when manually initiated by the operator.

   b. When the control system senses the generator set at rated voltage and frequency it shall operate to connect the loads to the generator set by opening the normal source contacts and closing the emergency source contacts at a predetermined time later. The timing sequence for the contact operation shall be programmable in the controller.

   c. The generator set shall operate connected to the load for the duration of the exercise period. If the generator set fails during this period the transfer switch shall automatically reconnect to the normal service.

   d. On completion of the exercise period the transfer switch shall operate to connect the loads to the normal source by opening the emergency source contacts and closing the normal source contacts a predetermined time later. The timing sequence for the contact operation shall be programmable in the controller.

   e. The transfer switch shall operate the generator set unloaded for a cool down period and then remove the start signal from the generator set. If the normal power fails at any time when the generator is running, the transfer switch shall immediately connect the system loads to the emergency source.

3. Generator set exercise test without load mode. The control system shall be configurable to test the generator set without transfer switch load connected. In this mode the transfer switch shall control the generator set in the following sequence.

   a. Transfer switch shall initiate the exercise sequence at a time indicated in the exercise timer program or when manually initiated by the operator.

   b. The control system shall operate the generator set unloaded for the duration of the exercise period.

   c. At the completion of the exercise period the transfer switch shall remove the start signal from the generator set. If the normal power fails at any time when the generator is running, the transfer switch shall immediately connect the system loads to the emergency source.

D. Start-up and Testing

1. An authorized employee of the manufacturer's service division shall perform the start-up and testing services.
2. Provide a minimum of eight (8) hours of on site start-up and testing, excluding travel time.
3. Provide a signed certificate stating the installation meets or exceed the manufacturer's installation standards and instructions.
4. Verification that the transfer switch is operating as specified.
5. Provide a printout of all as-commissioned adjustable set points for future reference.

E. Demonstration and Training.

1. An authorized employee of the manufacturer's service division shall perform the demonstration and training services. The demonstration and training period shall last a minimum of 4 hours and shall be provided on site.
2. The OWNER reserves the right to video tape the demonstration and training presentation for future in-house use.
3. Provide training handouts for 10 persons.

END OF SECTION

Exhibit A

Drawings

G:\PROJECTS\103 - West Yost Associates\1032109 - Sweet Home Wwtp Phase 1 Design\Design\(2) Drawings\Current\sweet Home Wwtp Phase 1 Design\Sheets\E-011 Service Entrance One-Line Diagram.dwg E-011 Service Entrance
One-Line Diagram 10/20/2022 11:05 AM JLUTE 24.1s (LMS Tech)

SHEET KEY NOTES

1. EQUIPMENT IS OWNER FURNISHED, CONTRACTOR INSTALLED.
2. PROVIDE AMP SENTRY RELAY.
3. PER SPECIFCATIONS, ALLEN BRADLEY PM-5000.

EXISTING
PACIFIC POWER
UTILITY VAULT

P001

XFMR-1
NEW UTILITY
TRANSFORMER

P002

SERVICE ENTRANCE SWITCHBOARD, SMSB-1 (1)
480/277V, 3Ø, 4-WIRE, 2500-AMP, 65-KAIC, NEMA 3R

UTILITY METER
AVAILABLE
FAULT CURRENT
33,500 AMPS

M

2500AF
2500AT
LSIG/ARMS

(3)
POWER
MONITOR

CT SECTION

MAIN SECTION

G001

C001

P003

P004

DIESEL GENSET, GEN-1 (1)
480V, 3Ø, 4-WIRE
900kW, 1125kVA

(2)
1600A

G002

C004

C002

MAIN ELECTRICAL & BLOWER BUILDING

(1) ATS-1
2500A
480/277V, 3Ø
4-POLE
NEMA 1
WITH BYPASS
CONTACTOR
100KAIC

N
E

PB
GEN-1
E-STOP

P007

MAIN SWITCHBOARD, MSB-1 (1)
480/277V, 3Ø, 4-WIRE, 2500-AMP, 65-KAIC

600AF 400AT LSIG
600AF 400AT LSIG
1200AF 800AT LSIG
1200AF 800AT LSIG
1200AF 1200AT LSIG
600AF 400AT LSIG
30AT
SPD

K
2500AF
2500AT
3P
LSIG/ARMS
NC

K
2500AF
2500AT
3P
LSIG/ARMS
NO

30AT
SPD
1200AF 800AT LSIG
1200AF 800AT LSIG
1200AF 1200AT LSIG
600AF 400AT LSIG
600AF 400AT LSIG

A-SIDE | MAIN | INCOMING | MAIN | B-SIDE

C006 P005
P100
P200
P300
P400
P500
P201
P301
P401
P501
C007 P006

ACTIVE HARMONIC FILTER AHF-1 (1)

MCC-100 CONNECTION SHEET: E-012
MCC-200 CONNECTION A SHEET: E-013
MCC-300 CONNECTION A SHEET: E-014
MCC-400 CONNECTION A SHEET: E-015
MCC-500 CONNECTION A SHEET: E-016
MCC-200 CONNECTION B SHEET: E-013
MCC-300 CONNECTION B SHEET: E-014
MCC-400 CONNECTION B SHEET: E-015
MCC-500 CONNECTION B SHEET: E-016

ACTIVE HARMONIC FILTER AHF-2 (1)

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

MB DESIGNED
JL DRAWN
BP CHECKED

REGISTERED PROFESSIONAL ENGINEER
86683
Digitally Signed
OREGON
MAY 08, 2012
BENJAMIN E. PERRY
EXPIRES: 12-31-2024

WEST YOST
Water. Engineered.

Landis Consulting
ENGINEERING SERVICES
6446 Fairway Ave. SE, Suite 220
Salem, OR 97306
503-584-1576
www.landisconsulting.com

Sweet Home
Oregon at its best!

MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS PROJECT PHASE 1

SERVICE ENTRANCE ONE-LINE DIAGRAM

PROJECT NO.: 936-50-21-09 | SCALE: AS NOTED | DATE: SEPTEMBER 2022

SHEET
E-011

Mahler Water Reclamation Facility (MWRF) Interim Improvements

ADDENDUM NO. 1

FOR

OWNER-PROVIDED ELECTRICAL EQUIPMENT PROCUREMENT

To: All Prospective Bidders

The following clarifications, changes, additions and/or deletions are hereby made a part of the Contract Documents issued for the above referenced project as fully and completely as if the same were fully set forth therein.

This Addendum consists of 2 pages, including this cover page.

BIDDER QUESTIONS

Q1. Is American Iron and Steel (AIS) applicable to the electrical equipment procurement?

A. Due to Project funding the AIS language as stated on the Advertisement for Bids is required to remain. The definition of "iron and steel products" means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials, as stated on page 1 of the Advertisement for Bids. Interpretations have consistently determined that mechanical and electrical components, equipment, and systems are not considered Construction Materials.

Q2. EJCDC C-200-Article 2; Section 2.01 states" Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). Please clarify what documents are available.

A. The Owner-Provided Electrical Equipment Procurement Bid Documents package, plus any addendum, makes up the entirety of the documents required to submit a bid.

CHANGES AND ADDITIONS AND/OR DELETIONS

Additions are shown in underline. Deletions are shown in strikeout.

1. Section 00 40 00 Bid Form; Bidder Identification and Signatures:

Delete Line ~~"State of Incorporation and Oregon CCB License line~~.

2. Section 00 40 00: Bid Form; Bid Schedule; Section 1.01 Lump Sum Work, Item B:

Replace: ~~Lump Sum Bid Price: $~~ Specification Sections Included in the Bid:

_____

3. Section 00 40 00: Bid Form; Bid Schedule; Section 1.01 Lump Sum Work.

Add Item C:

C. Lump Sum Bid Price $_____

4. Section 00 43 33; Designated Equipment List; Paragraph 1:

Add: The Bidder states that the manufacturer of each listed item of equipment or material proposed by the Contractor for use on this Project will be as listed below (state "Not Applicable" in the table if not bidding on the item listed):

5. Section 26 36 23; Section 1.03B

Delete 1.03.B: ~~Refer to Section 26 05 00 – Common Work Results for Electrical Submittals for additional requirements.~~

6. EJCDC C-111 Advertisement for Bids

   Change: "Bids for ~~the construction of~~ the Project will be received at The Automation Group, 4678 Isabelle St. Eugene, OR 97402 until January ~~10~~ 24, 2023 at 2:00 pm local time. "

End of Addendum No. 1

	January 09, 2023
Mr. Greg Springman, Public Works Director	Date

City of Sweet Home
1400 24th Avenue
Sweet Home, OR 97386

Mahler Water Reclamation Facility (MWRF) Interim Improvements

Sludge Blend Tank Design-Build

December 2022

WEST YOST
Water. Engineered.

5 Centerpointe Dr #130,
Lake Oswego, OR 97035
(530) 756-5905
FAX (530) 756-5991

MWRF Interim Improvements Project Sludge Blend Tank Design-Build
Table of Contents

BIDDING REQUIREMENTS

EJCDC C-111	Advertisement for Bids
EJCDC C-200	Instruction to Bidders
00 40 00	Bid Form
EJCDC C-430	Bid Bond (Penal Sum Form)
00 43 37	First-Tier Subcontractor Disclosure Form
00 45 19	Non-Collusion Affidavit

CONTRACT FORMS

EJCDC D-520	Agreement between Owner and Design-Builder
EJCDC D-610	Design-Build Performance Bond
EJCDC D-615	Design-Build Payment Bond

CONDITIONS OF THE CONTRACT

EJCDC D-700	Standard General Conditions of the Contract Between Owner and Design-Builder

TECHNICAL SPECIFICATIONS

Division 01 – General Requirements

01 33 00	Submittals

Division 2 – Existing Conditions

02 41 00	Demolition, Salvage and Abandonment

Division 05 – Metals

05 50 01	Anchor Bolts and Anchoring Devices
05 52 00	Handrail

Division 13 – Specialty Construction

13 21 20	Reinforced Cast-In-Place Concrete Tank

Division 31 – Earthwork

31 00 00	Earthwork
31 10 00	Site Preparation
31 23 16.26	Rock Excavation
31 23 19	Dewatering
31 50 00	Excavation Support and Protection

EXHIBIT A: Drawings

G-000	Cover Sheet, Vicinity and Location Maps
C-005	Site Demolition & Tree Removal
C-010	Overall Site Plan, Structure Coordinates, Staging and Access, Survey Control Points
C-020	Solids Area Detail Plan
C-040	Erosion Control & Civil Details
M-250	Sludge Blend Tank and Mixing System Plan, Sections and Details
S-001	Structural Design Criteria

EXHIBIT B - Geotechnical Data Report

EXHIBIT C - Sample AIS Forms

EXHIBIT D - Geotechnical Engineering Report

EXHIBIT E – Design-Builder's Exhibit of Warranty Guarantee

ADVERTISEMENT FOR BIDS

CITY OF SWEET HOME, OREGON
MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD

General Notice

City of Sweet Home (Owner) is requesting Bids for the construction of the following Project:

MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD

Bids for the construction of the Project will be received at Sweet Home City Hall located at 3225 Main Street, Sweet Home, OR 97386, until **January 24, 2023 at 2:00 pm** local time. At that time the Bids received will be publicly opened and read.

The Project includes the following Work:

Improvements and modifications to the City of Sweet Home Mahler Water Reclamation Facility (Mahler WRF) includes furnishing all labor, materials, and equipment necessary for the design and construction of new Sludge Blend Tank and appurtenances. Site work includes general excavation with onsite and offsite disposal and installation of structural base rock.

Obtaining the Bidding Documents for Bidders

For Bidders, the Contract Documents may be examined at Sweet Home City Hall. Electronic copies of the Contract Documents will be provided by the Owner. Hard copies of the Contract Documents will be provided to the successful Bidder following Bid Award.

Instructions to Bidders

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders included in the Bidding Documents.

American Iron and Steel

Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project. All iron and steel products used in this project must be produced in the United States. The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials.

The following waivers apply to this Contract:

1. De Minimis,
2. Minor Components, and
3. Pig iron and direct reduced iron.

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This Advertisement is issued by:

Owner: **City of Sweet Home, Oregon**
By: **Greg Springman**
Title: **Public Works Director**
Date: **December 14, 2022**

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INSTRUCTIONS TO BIDDERS FOR DESIGN-BUILD CONTRACT

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ARTICLE 1—DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.04 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective Bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

2.06 *Electronic Documents*

A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of

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the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.

1. Electronic Documents that are available in native file format include:

a. Electronic Drawing files in Revit, AutoCAD MEP and AutoCAD Civil3D.

b. Digital Elevation Model (DEM) for the construction site

2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.

3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.

4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—RESERVED

ARTICLE 4— RESERVED

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of

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materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.02 *Existing Site Conditions*

A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The General Conditions identify the following regarding existing conditions at or adjacent to the Site:

a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.

b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.

c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make electronic copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. *Geotechnical Report:* The Bidding Documents contain a Geotechnical Data Report (GDR) for use by Bidders (Supplemental Information – bound separately).

a. As set forth in the General Conditions, the GDR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GDR is a Contract Document.

b. The Baseline Conditions in the GDR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GDR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.

c. Nothing in the GDR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the

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presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

A. Documents regarding existing Site conditions referred to in Paragraph 5.02.A are listed in the General Conditions 10.01(A.4). Owner will make copies of these other Site-related documents available to any Bidder on request.

B. Bidder shall consider information contained on these other site-related documents to be un-verified and shall not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.

C. The other Site-related documents are not part of the Contract Documents.

D. Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.

5.04 *Site Visit and Testing by Bidders*

A. Bidder may schedule a site visit. During the visit the Bidder must not disturb any ongoing operations at the Site.

B. Bidders visiting the Site are required to arrange their own transportation to the Site.

C. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer contact for visiting the Site: Mr. Steven Haney, Utilities Manager, (541) 818-8003.

D. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

E. On request and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

F. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

G. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

A. Site visits and work at the Site is governed Oregon OSHA requirements.

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5.06 *Other Work at the Site*

A. Reference is made to Article 8 of the General Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6— BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Design-Builder) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Owner and Engineer in writing.

7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all and registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5% percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents. Bid security must be at least 5% of the Bidder's maximum price.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder

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will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 91 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.

9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

10.03 Substitutes and "or-equal" materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.05 and 7.06 of the General Conditions after the Effective Date of the Contract. Each such request shall include Manufacturer's Certification letter to document compliance with AIS requirements of Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference, if applicable. Refer to Manufacturer's Certification Letter provided in these Contract Documents.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.01 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner the First-Tier Subcontractor Disclosure within 2 hours following the Bid Opening.

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ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

C. Bidders shall provide pricing for all "A-listed" or first-named equipment suppliers in the Bid Form.

12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 All names must be printed in ink below the signatures.

12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

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12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

A. Bidders must submit a Bid on a lump sum basis for each bid item as set forth in the Bid Form.

13.02 *Additive and Deductive Unit Price Work Bid Items*

A. Bidders must submit unit prices for bid items with additional work beyond the quantities included in the Lump Sum Bid.

1. Additive and Deductive Unit Price Work Items shall include:

a. None

B. Costs for Additive and Deductive Unit Price Work Bid Items will be considered by the Owner in the evaluation of bids based on the potential impact of increased or decreased quantities for these Bid items in the course of executing the Work.

C. Bidders shall not unbalance bids for Additive and Deductive Unit Price Work Items.

ARTICLE 14—SUBMITTAL OF BID

14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form and the First-Tier Subcontractor Disclosure Form are to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of the Bid Form.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, the name and address of Bidder, the date of opening, the applicable words "SEALED BID" or "FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM" and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED" or "FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM." A mailed Bid must be addressed to the location designated in the Advertisement.

14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

14.04 All responses submitted are the property of the City of Sweet Home, thus subject to disclosure pursuant to Oregon Public Records law, as qualified by ORS 279B.060(6) for similar contracts. Except for information marked "Proprietary", all documents received by City shall be available for public disclosure. The City will attempt to maintain the confidentiality of materials marked "Proprietary" to the extent permitted under the Oregon Public Records law. By responding to this solicitation, Bidders waive any challenge to the City's decisions in this regard.

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14.05 **Marking all, or substantially all, or your response as "Proprietary" is not permitted and may be grounds for the City considering your bid nonresponsive, at the City's sole discretion.** If your response contains proprietary information protected under this section, please provide an additional redacted copy.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

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18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. For determination of the apparent lowest responsive and responsible Bidder, Bids will be compared on the basis of the Lump Sum Price along with potential additional costs for Additive or Deductive Additional Work Bid Items determined at the Owner's discretion.

18.06 *Protests of Solicitation*

A. Bidders are directed to the protest procedures contained in OAR 137-049-260:

1. (3)(a) An Offeror may protest Specifications or Contract terms and conditions. Unless otherwise specified in the Solicitation Document, an Offeror must deliver a Written protest on those matters to the Contracting Agency not less than 10 Days prior to Closing;

2. (b) Content of Protest.

a. (A) An Offeror's Written protest shall include:

1) (i) A detailed statement of the legal and factual grounds for the protest;

2) (ii) A description of the resulting prejudice to the Offeror; and

3) (iii) A statement of the desired changes to the Contract terms and conditions, including any Specifications.

18.07 *Protests of Contract Award*

A. Bidders are directed to the protest procedures contained in OAR 137-049-450:

1. (4) Right to Protest Award.

a. (a) An adversely affected or aggrieved Offeror may submit to the Contracting Agency a Written protest of the Contracting Agency's intent to Award within seven Days after issuance of the notice of intent to Award the Contract, unless a different protest period is provided under the Solicitation Document.

b. (b) The Offeror's protest must be in Writing and must specify the grounds upon which the protest is based.

c. (c) An Offeror is adversely affected or aggrieved only if the Offeror is eligible for Award of the Contract as the Responsible Bidder submitting the lowest Responsive Bid or the Responsible Proposer submitting the best Responsive Proposal and is next in line for Award, i.e., the protesting Offeror must claim that all lower Bidders or higher-scored Proposers are ineligible for Award:

1) (A) Because their Offers were nonresponsive; or

2) (B) The Contracting Agency committed a substantial violation of a provision in the Solicitation Document or of an applicable Procurement statute or administrative rule, and the protesting Offeror was unfairly evaluated and would have, but for such substantial violation, been the Responsible Bidder

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offering the lowest Bid or the Responsible Proposer offering the highest-ranked Proposal.

d. (d) The Contracting Agency shall not consider a protest submitted after the time period established in this rule or such different period as may be provided in the Solicitation Document. A Proposer may not protest a Contracting Agency's decision not to increase the size of the Competitive Range above the size of the Competitive Range set forth in the RFP.

2. (5) Right to Protest Competitive Range.

a. (a) An adversely affected or aggrieved Bidder may submit to the Contracting Agency a Written protest of the Contracting Agency's decision to exclude the Bidder from the Competitive Range within seven Days after issuance of the notice of the Competitive Range, unless a different protest period is provided under the Solicitation Document. (See procedural requirements for the use of RFPs at OAR 137-049-0650.)

b. (b) The Bidder's protest shall be in Writing and must specify the grounds upon which the protest is based.

c. (c) A Bidder is adversely affected only if the Bidder is responsible and submitted a Responsive Bid and is eligible for inclusion in the Competitive Range, i.e., the protesting Bidder must claim it is eligible for inclusion in the Competitive Range if all ineligible higher-scoring Bidders are removed from consideration, and that those ineligible Bidders are ineligible for inclusion in the Competitive Range because:

1) (A) Their Bids were not responsive; or

2) (B) The Contracting Agency committed a substantial violation of a provision in the RFP or of an applicable Procurement statute or administrative rule, and the protesting Bidder was unfairly evaluated and would have, but for such substantial violation, been included in the Competitive Range.

ARTICLE 19—BONDS AND INSURANCE

19.01 Article 6 of the General Conditions sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.

19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful

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Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 21— PREVAILING WAGES

21.01 The Contractor shall abide by ORS 279c.800 through 279c.870 which relate to the prevailing wage rates for the building and construction trades in the state of Oregon. These prevailing wage rates are shown in the published Oregon Bureau of Labor and Industries (BOLI) documentation, which is described in these Contract Documents. Federal Davis-Bacon act requirements also apply, as executed by the United States Department of Labor (DOL). The higher of the two wages shall be paid to all workers as applicable on this project. The Contractor shall be aware of the requirements described elsewhere in these Contract Documents. Both items are referenced and described in the Oregon DEQ form "Prevailing Wage Agreement" included in these Contract Documents, which is a form that is required to be completed by the Contractor and submitted at the time of bid placement.

21.02 Bidders are advised to examine and to be thoroughly familiar with such requirements. No claim for additional compensation will be allowed that is based upon a lack of knowledge of these requirements or a failure to include adequate increases in such wages over the term of this Contract in the Bidder's bid price.

ARTICLE 22— PREVAILING WAGE RATE FORMS

22.01 Before payment is made by the Owner of any sums due under this Contract, the Owner must receive from the Contractor and each subcontractor or agent a copy of all required BOLI & DOL forms and Weekly Certified Payrolls from the Contractor and each subcontractor or agent.

22.02 Upon completion of this contract, the Owner must receive from the Contractor and each subcontractor a copy of all required BOLI and DOL forms for project closeout.

22.03 These forms and any required affidavits will be required before any funds retained are released to the Contractor. Forms may be obtained from BOLI and DOL. In some cases fees are required to accompany forms submitted. The Contractor is responsible for payment of these fees and shall make all applications directly to BOLI/DOL. These fees shall be incidental to all bid items of this Contract.

ARTICLE 23—NONDISCRIMINATION

23.01 During the performance of this contract, the Contractor shall comply with all federal and state nondiscrimination laws, including, but not limited to 42 U.S.C. 12101 et seq, the Americans with Disabilities Act (ADA).

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SECTION 00 40 00 - BID FORM

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD
CITY OF SWEET HOME, OREGON

THIS BID IS SUBMITTED TO: City of Sweet Home
Attn: Greg Springman, Public Works Director
3225 Main Street
Sweet Home, OR 97386

1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2.01 Bidder accepts all of the terms and conditions of the Advertisement for Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.

2.02 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.06 of the General Conditions on or before the **dates or within the number of calendar days indicated in the Agreement.**

2.03 Bidder agrees to complete the Work in accordance with the contract times provided in Article 3 of the Agreement.

2.04 Bidder accepts the provisions of the Agreement as to liquidated damages as stipulated in Article 23.03 of the Agreement and in the General Conditions.

3.01 Refer to the Instructions to Bidders for forms and documents that must be executed in full and submitted with the bid.

3.02 The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, and the General Conditions.

3.03 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data and documents identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

Addendum No.	**Addendum Date**

B. Bidder has become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site.

E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

I. Bidder has given OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by OWNER is acceptable to Bidder.

J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.01 Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the price described in the following bid schedule within the time of completion specified in the Agreement.

BID SCHEDULE

Bidder shall submit a Bid as set forth in the Bid form. Submission of Bids on this schedule signifies Bidder's willingness to enter into a Contract for the price offered. Bidders offering a Bid on this schedule must be capable of completing the Work within the time period stated in the Agreement. OWNER may elect to delete any bid item from the work.

1.01 LUMP SUM WORK

A. Bidder proposes and agrees to accept as full payment the following bid amount for the Mahler WRF Sludge Blend Tank Design-Build proposed within the Bidding Documents, and certifies that this amount is based upon the undersigned's own estimate of quantities and costs and includes sales, consumer, use, and other taxes, except as provided below, overhead and profit.

B. Lump Sum Bid Price: $_____

1.02 ADDITIVE AND DEDUCTIVE UNIT PRICE WORK BID ITEMS

Provide unit prices for increased (additive) or reduced (deductive) quantities of the following Additive and Deductive (AD) Unit Price Work Bid Items. Lump Sum Bid Price shall include the Base Bid Quantity noted for each AD Bid Item. Additive (Add) Unit Prices shall be for actual construction quantities in excess of the Base Bid Quantity. Deductive (Deduct) Unit Prices shall be for quantities less than the Base Bid Quantity. Engineer shall confirm all quantities for Additive or Deductive Unit Price Work Bid Items.

AD-1. Rock Excavation
Base Bid Quantity included with Lump Sum Bid: **Quantity Undetermined**
Add $_____ per Cubic Yard for additional Rock Excavation Write in Amount:

Bidder Identification and Signatures

Name of Firm: _____

Federal Tax ID No: _____

State of Incorporation and Oregon CCB License No: _____

Bidder ☐ IS / ☐ IS NOT a "Resident Bidder" as defined by ORS 279.029.

Signature and Printed Name(s): *(If Bidder is a partnership or joint venture, all parties must sign below)*

_____ _____

_____ _____

Title _____

Date _____

END OF SECTION

BID BOND (PENAL SUM FORM)

Bidder Name: Address *(principal place of business)*:	**Surety** Name: Address *(principal place of business)*:
Owner Name: City of Sweet Home, Oregon Address *(principal place of business)*: 3225 Main Street Sweet Home, OR 97386	**Bid** Project *(name and location)*: Mahler Water Reclamation Facility Sludge Blend Tank Design-Build 1357 Pleasant Valley Road Sweet Home, OR 97386 Bid Due Date: January 24, 2023
Bond Penal Sum: Date of Bond:	

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	Surety
_____ *(Full formal name of Bidder)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

EJCDC® C-430, Bid Bond (Penal Sum Form).
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1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
    3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
    3.2. All Bids are rejected by Owner, or
    3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

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SECTION 00 43 37 - FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

(To Be Submitted After Bid)

FOR

CITY OF SWEET HOME
MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD

Bid Closing: **January 24, 2023** at 2:00 p.m.

Disclosure Submittal Deadline**: January 24, 2023** at 4:00 p.m.

This form must be completed, signed and submitted at the location specified in the Invitation to Bid on the advertised bid closing date and within two working hours after the advertised bid closing time.

Bidders are required to disclose information about certain first-tier subcontractors (see ORS 279C.370). Specifically, when the contract amount of a first-tier subcontractor furnishing labor and material would be greater than or equal to: (i) 5% of the project Bid, but at least $15,000; or (ii) $20,000 regardless of the percentage, the Bidder must disclose the following information about that subcontractor either in its Bid submission, or within two hours after Bid Closing.

List below the names of each subcontractor that will be furnishing labor or furnishing labor and materials and that are required to be disclosed, the category of work that the subcontractor will be performing and the dollar value of the subcontract. Enter 'NONE' if there are no subcontractors that are required to be disclosed. (ATTACH ADDITIONAL SHEETS IF NEEDED).

Subcontractor Name	Dollar Value	Category of Work

Failure to submit this form by the disclosure deadline will result in a nonresponsive bid. A nonresponsive bid will not be considered for award.

Form Submitted by (Bidder Name): _____

Contact Name: _____ **Phone No.:** _____

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SECTION 00 45 19 – NON-COLLUSION AFFIDAVIT

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD
CITY OF SWEET HOME, OREGON

STATE OF OREGON
COUNTY OF LINN

I state that I am_____(title) of_____(name of firm) and that I am authorized to make this affidavit on behalf of my firm and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder, except as disclosed on the attached appendix.

(2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

(5) _____(name of firm), its affiliates, subsidiaries, officers, directors and employees are not currently under investigation by any governmental agency for violating any non-collusion statutes and have not in the last four years been convicted of or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described in the attached appendix.

I state that_____(name of firm) understands and acknowledges that the above representations are material and important and will be relied on by the City of Sweet Home in awarding the contract(s) for which this bid is submitted. I understand, and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the City of Sweet Home of the true facts relating to the submission of bids for this contract.

_____
Authorized Signature

_____
Name of Company / Position

Sworn to and subscribed before me this_____day of_____, 20____.

_____ _____
Notary Public for the State of Oregon My Commission Expires

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AGREEMENT
BETWEEN OWNER AND DESIGN-BUILDER
ON THE BASIS OF A STIPULATED PRICE

THIS AGREEMENT is by and between City of Sweet Home, Oregon ("Owner"), and [ ] ("Design-Builder").

PROJECT INFORMATION

Project: Mahler Water Reclamation Facility Interim Improvements Project

Design-Build Contract: Mahler Water Reclamation Facility Sludge Blend Tank Design-Build ("Contract")

Owner's Consultant: West Yost Associates, Inc .

Engineer: Design-Builder has retained [ ] ("Engineer") for the performance of professional engineering services under this Contract.

Authorized Representatives: Owner and Design-Builder each hereby designates a specific individual authorized to act as representative with respect to the performance of responsibilities under this Contract. Such an individual shall have authority to transmit instructions, receive formal notices, receive information, and render decisions relative to this Contract on behalf of the respective party that the individual represents.

1. Owner's Authorized Representative:
   West Yost Associates, Inc.
   Preston Van Meter, Principal Engineer
   5 Centerpointe Dr #130, Lake Oswego, OR 97035

   503.451.2161
   pvanmeter@westyost.com

2. Design-Builder's Authorized Representative: [ ] ***[include mailing and delivery addresses, e-mail address, telephone numbers]***

Owner and Design-Builder further agree as follows:

ARTICLE 1 – THE WORK

1.01 *General Description of Work*

A. Design-Builder shall complete all Work as specified or indicated in the Contract. The Work is generally described as the design and construction of the following: new 100,000-gallon cast-in-place concrete Sludge Blend Tank including appurtenances and associated site work.

ARTICLE 2 – CONTRACT TIMES

2.01 *Time of the Essence*

A. All time limits for Design-Builder's attainment of Milestones, if any, Substantial Completion, and completion and readiness for final payment, as stated in the Contract, are of the essence of the Contract.

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2.02 *Contract Times: Dates*

A. Design-Builder will substantially complete the Work on or before April 27, 2023.

B. Design-Builder will have the Work completed and ready for final payment, in accordance with Paragraph 14.06 of the General Conditions, on or before June 16, 2023.

C. Design-Builder shall attain the following Milestone(s):

1. Milestone 1: Design-Builder shall have submitted tank shop drawings and all associated Project submittals on or before February 9, 2023.

2.03 *Liquidated Damages*

A. Design-Builder and Owner recognize that time is of the essence as stated in Paragraph 2.01 above, and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 2.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving, in a lawsuit or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Design-Builder agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Design-Builder shall pay Owner $500 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 2.02.A above for Substantial Completion until the Work is substantially complete.

2. Completion of Remaining Work: After Substantial Completion, if Design-Builder shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Design-Builder shall pay Owner $500 for each day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion, final completion, and Milestones (if applicable) are not additive, and will not be imposed concurrently. Liquidated damages for failing to attain Substantial Completion shall take precedence.

ARTICLE 3 – CONTRACT PRICE

3.01 *Stipulated Sums*

A. Owner shall pay Design-Builder for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

1. For all Work other than Unit Price Work, a lump sum of: $[ ].

3.02 *Changes in Contract Price Based on Cost of the Work*

A. If the price of Design Professional Services covered by a Change Order or an adjustment in the Contract Price is determined on the basis of Cost of the Work, then for such Design Professional Services (exclusive of reimbursable expenses, if any) the Engineer, Project Design Professional, or other design entity performing the Design Professional Services (regardless of tier) may invoice no more than the direct labor cost of each employee providing services multiplied by a factor of 2.7, which covers labor costs, overhead, and profit.

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B. If the value of Work covered by a Change Order or an adjustment in the Contract Price is determined on the basis of Cost of the Work, and involves Work performed under Construction Subcontracts or Design Agreements, the allowable mark-ups on lower tier invoices shall be limited as stated in Paragraph 11.05.D.2.c and d of the General Conditions.

ARTICLE 4 – PAYMENT PROCEDURES

4.01 *Submittal and Processing of Payments*

A. Design-Builder shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Owner will process Applications for Payment as provided in the General Conditions.

4.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Design-Builder's Applications for Payment on or about the 10th day of each month during performance of the Work as provided in Paragraph 4.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

a. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Owner, and if the character and progress of the Work have been satisfactory to Owner, then as long as the character and progress of the Work remain satisfactory to Owner, there will be no additional retainage; and

b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Design-Builder to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 14.01.G of the General Conditions, and less 200 percent of Owner's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

C. Notwithstanding the provisions above, no retainage shall be withheld with respect to the portion of a payment application pertaining to engineering, design, and other professional services.

4.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.06 of the General Conditions, Owner shall pay the remainder of the Contract Price.

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ARTICLE 5 – INTEREST

5.01 *Interest Rate*

A. All amounts not paid when due shall bear interest at the rate of 6 percent per annum, or if applicable at the rate stated in a governing prompt payment statute.

ARTICLE 6 – DESIGN-BUILDER'S REPRESENTATIONS

6.01 *Representations*

A. Design-Builder makes the following representations for Owner's reliance:

1. Design-Builder has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

2. Design-Builder has become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Design-Builder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Design-Builder has carefully studied all: (a) reports of explorations and tests of subsurface conditions at or adjacent to the Site, and all drawings of physical conditions relating to existing surface or subsurface structures at the Site, if any, that Owner has identified or made available to Design-Builder, especially with respect to Technical Data in such reports and drawings, and (b) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site, that Owner has identified or made available to Design-Builder, especially with respect to Technical Data in such reports and drawings.

5. Design-Builder has considered the information known to Design-Builder itself, and to Construction Subcontractors and Project Design Professionals that Design-Builder has selected as of the Effective Date; information commonly known to design professionals, design-builders, and contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings (if any) identified in the Contract Documents or otherwise made available to Design-Builder, with respect to the effect of such information, observations, and documents on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Design-Builder; and (c) Design-Builder's safety precautions and programs.

6. Based on the information and observations referred to in the preceding paragraph, Design-Builder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary prior to entry into the Contract at the Contract Price, subject to the Contract Times.

7. Design-Builder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

8. Design-Builder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Design-Builder has discovered in the Contract Documents, and the written response from Owner is acceptable to Design-Builder.

9. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

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10. Design-Builder's entry into this Contract constitutes an incontrovertible representation by Design-Builder that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 7 – CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement.
2. Performance bond.
3. Payment bond.
4. Design-Builder's Exhibit of Warranty Guarantee.
5. General Conditions.
6. Technical Specifications
7. Conceptual Documents:
    a. Cover Sheet, Vicinity and Location Maps
    b. Overall Site Plan and Staging Areas Plan
    c. Solids Area Detail Plan & Details
    d. Tank Mechanical Sections and Details
    e. Structural Design Criteria
8. Addenda (numbers [ ] to [ ], inclusive).
9. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Work Change Directives.
    b. Change Orders.
    c. Record Drawings and Record Specifications

B. The documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 8 – MISCELLANEOUS

8.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and Supplementary Conditions.

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8.02 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on the other party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

8.03 *Successors and Assigns*

A. Owner and Design-Builder each binds itself, its successors, assigns, and legal representatives to the other party hereto, and its successors, assigns, and legal representatives, in respect to all covenants, agreements, and obligations contained in the Contract.

8.04 *Severability*

A. Any provision or part of the Contract held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Design-Builder, who agree that the Contract shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

8.05 *Design-Builder's Certifications*

A. Design-Builder certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.05:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

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IN WITNESS WHEREOF, Owner and Design-Builder have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

OWNER:	DESIGN-BUILDER:
City of Sweet Home, Oregon	
By:	By:
Title:	Title:
	[If Design-Builder is a corporation, partnership, LLC, or a joint venture, attach evidence of authority to sign. In the case of a joint venture, expand the signature section to accommodate execution of the Agreement by an authorized representative of each joint venturer.]
Attest:	Attest:
Title:	Title:
Address for giving notices:	Address for giving notices:
3225 Main Street	
Sweet Home, OR 97386	
	License No.: _____ *(where applicable)*
[If Owner is a corporation, partnership, or LLC, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.]	***NOTE(S) TO USER: Use in those states or other jurisdictions where licensing is applicable or required.***

EJCDC® D-520, Agreement Between Owner and Design-Builder on the Basis of a Stipulated Price.
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EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

DESIGN-BUILD PERFORMANCE BOND

DESIGN-BUILDER *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER: **City of Sweet Home**
1400 24th Ave., Sweet Home, OR 97386

DESIGN-BUILD CONTRACT
Effective Date of the Contract:
Amount:
Description *(name and location)*:

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Design-Builder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Design-Build Performance Bond to be duly executed by an authorized officer, agent, or representative. ***[Note: Provide supplemental execution by any additional parties, such as joint venturers.]***

DESIGN-BUILDER AS PRINCIPAL	**SURETY**
Design-Builder's Name	Surety's Name
By: Signature	**By:** Signature *(attach power of attorney)*
Print Name	Print Name
Title	Title
Attest: Signature	**Attest:** Signature
Title	Title

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1. The Design-Builder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Design-Build Contract, which is incorporated herein by reference.

2. If the Design-Builder performs the Design-Build Contract, the Surety and the Design-Builder shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Design-Build Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Design-Builder and the Surety that the Owner is considering declaring a Design-Builder Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Design-Builder, and Surety to discuss the Design-Builder's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Design-Builder, and the Surety agree, the Design-Builder shall be allowed a reasonable time to perform the Design-Build Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Design-Builder Default;

3.2 The Owner declares a Design-Builder Default, terminates the Design-Build Contract, and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Design-Build Contract Price in accordance with the terms of the Design-Build Contract to the Surety, or to a design-builder or contractor selected to perform the Design-Build Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Design-Builder, with the consent of the Owner, to perform and complete the Design-Build Contract;

5.2 Undertake to perform and complete the Design-Build Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified design-builders or contractors acceptable to the Owner for a contract for performance and completion of the Design-Build Contract, arrange for a contract to be prepared for execution by the Owner and a design-builder or contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Design-Build Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Design-Build Contract Price incurred by the Owner as a result of the Design-Builder Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new design-builder or contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

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7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Design-Builder under the Design-Build Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Design-Build Contract. Subject to the commitment by the Owner to pay the Balance of the Design-Build Contract Price, the Surety is obligated, without duplication, for:

7.1 the responsibilities of the Design-Builder for correction of defective work and completion of the Design-Build Contract;

7.2 additional legal, design professional, and delay costs resulting from the Design-Builder's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Design-Build Contract, actual damages caused by delayed performance or non-performance of the Design-Builder.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Design-Builder that are unrelated to the Design-Build Contract, and the Balance of the Design-Build Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Design-Build Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction where the construction portion of the Project is located, and shall be instituted within two years after a declaration of Design-Builder Default, or within two years after the Design-Builder ceased working, or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice under this Bond to the Surety, the Owner, or the Design-Builder shall be in writing, and mailed or delivered to the recipient's address as shown in this Bond.

13. When this Bond has been furnished to comply with a statutory or other legal requirement where the construction portion of the Project is located, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted from this Bond and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Design-Build Contract Price: The total amount payable by the Owner to the Design-Builder under the Design-Build Contract after all proper adjustments have been made including allowance for the Design-Builder for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Design-Builder is entitled, reduced by all valid and proper payments made to or on behalf of the Design-Builder under the Design-Build Contract.

14.2 Design-Build Contract: The agreement between the Owner and Design-Builder identified as such in this Bond, including all Contract Documents and changes duly made to such Design-Build Contract.

14.3 Design-Builder Default: Failure of the Design-Builder, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Design-Build Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Design-Builder as required under the Design-Build Contract, or to perform and complete or comply with the other material terms of the Design-Build Contract.

14.5 Contract Documents: All the documents that comprise the contract between the Owner and Design-Builder.

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15. Any singular reference to Design-Builder, Surety, Owner, or other party shall be considered plural where applicable.

16. Modifications to this Bond are as follows:

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EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

DESIGN-BUILD PAYMENT BOND

DESIGN-BUILDER *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*: **City of Sweet Home**
1400 24th Ave., Sweet Home, OR 97386

DESIGN-BUILD CONTRACT

Effective Date of the Contract:
Amount:
Description *(name and location)*:

BOND

Bond Number:
Date *(not earlier than the Effective Date of the Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Design-Builder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative. ***[Note: Provide supplemental execution by any additional parties, such as joint venturers.]***

DESIGN-BUILDER AS PRINCIPAL	**SURETY**
_____	_____
Design-Builder's Name	Surety's Name
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

EJCDC® D-615, Design-Build Payment Bond.
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1. The Design-Builder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, services, materials, and equipment furnished for use in the performance of the Design-Build Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Design-Builder promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, services, materials, or equipment furnished for use in the performance of the Design-Build Contract, then the Surety and the Design-Builder shall have no obligation under this Bond.

3. If there is no Owner Default under the Design-Build Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Design-Builder and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, services, materials, or equipment furnished for use in the performance of the Design-Build Contract, and tendered defense of such claims, demands, liens, or suits to the Design-Builder and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

5.1 Claimants that do not have a direct contract with the Design-Builder,

5.1.1 have furnished a written notice of non-payment to the Design-Builder, stating with substantial accuracy the amount claimed and the name of the party to which the materials were, or equipment was, furnished or supplied, or for which the labor was done or performed, within ninety (90) days after having last performed labor or services, or last furnished materials or equipment included in the Claim; and

5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).

5.2 Claimants who are employed by or have a direct contract with the Design-Builder have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Design-Builder, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

7.2 Pay or arrange for payment of any undisputed amounts.

7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Design-Builder may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

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8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Design-Builder under the Design-Build Contract shall be used for the performance of the Design-Build Contract and to satisfy claims, if any, under any design-build performance bond. By the Design-Builder furnishing and the Owner accepting this Bond, they agree that all funds earned by the Design-Builder in the performance of the Design-Build Contract are dedicated to satisfy obligations of the Design-Builder and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Design-Builder that are unrelated to the Design-Build Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Design-Build Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction where the construction portion of the Project is located, or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Design-Build Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Design-Builder shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement where the construction portion of the Project is located, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted from this Bond and provisions conforming to such statutory or other legal requirement shall be deemed incorporated here. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Design-Builder and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the individual or entity for which the labor or services were done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, services, materials, or equipment were furnished for use in the performance of the Design-Build Contract;
4. A brief description of the labor, services, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or services, or last furnished materials or equipment, for use in the performance of the Design-Build Contract;
6. The total amount earned by the Claimant for labor, services, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and

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8. The total amount due and unpaid to the Claimant for labor, services, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Design-Builder or with a subcontractor of the Design-Builder to furnish labor, services, materials, or equipment for use in the performance of the Design-Build Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, services, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Design-Build Contract, architectural and engineering services required for performance of the work of the Design-Builder and the Design-Builder's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Design-Build Contract:** The agreement between the Owner and Design-Builder identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default**: Failure of the Owner, which has not been remedied or waived, to pay the Design-Builder as required under the Design-Build Contract, or to perform and complete or comply with the other material terms of the Design-Build Contract.

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Design-Builder.

17. Any singular reference to Design-Builder, Surety, Owner, or other party shall be considered plural where applicable.

18. Modifications to this Bond are as follows:

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STANDARD GENERAL CONDITIONS OF THE CONTRACT BETWEEN OWNER AND DESIGN-BUILDER

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STANDARD GENERAL CONDITIONS OF THE CONTRACT BETWEEN OWNER AND DESIGN-BUILDER

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Contract Documents and printed with initial capital letters, the following terms have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda:* Written or graphic instruments issued by Owner prior to the opening of Proposals which clarify, correct, or change the Request for Qualifications, Request for Proposals, or the proposed Contract Documents, including the Conceptual Documents.

2. *Agreement:* The written instrument, executed by Owner and Design-Builder, that sets forth the Contract Price and Contract Times, identifies the parties, and designates the specific items that are Contract Documents.

3. *Application for Payment:* The form which is to be used by Design-Builder during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Authorized Representative:* The individual designated by a party to represent it with respect to this Contract, as indicated in the Agreement.

5. *Change Order:* A document which is signed by Design-Builder and Owner and authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

6. *Claim:* A demand or assertion by Owner or Design-Builder seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A request or proposal for a Change Order is not a Claim.

7. *Conceptual Documents:* The documents prepared by or for the Owner to describe the Work to be performed, issued to Proposers during the design-builder selection process, and expressly identified in the Agreement.

8. *Constituent of Concern:* Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other Laws or Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

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9. *Construction:* The part of the Work that consists generally of making physical improvements at the Site, and is the result of performing or furnishing of labor, the furnishing and incorporating of materials and equipment into the Work (including any correction of defective Construction), and the furnishing of services (other than Design Professional Services) and documents, all as required by the Contract Documents and Construction Drawings and Construction Specifications, as duly modified.

10. *Construction Drawings:* Documents prepared by or for Design-Builder, and approved by Owner for purposes of allowing Design-Builder to proceed with the Construction or specific portions of the Construction, and consisting of drawings, diagrams, illustrations, schedules, and other data that graphically show the scope, extent, and character of the Construction (or specific portions of the Construction) to be performed by or for Design-Builder. Construction Drawings are not Contract Documents.

11. *Construction Specifications:* Documents prepared by or for Design-Builder, and approved by Owner for purposes of allowing Design-Builder to proceed with the Construction or a specific portion of the Construction, and consisting of written requirements for materials, equipment, systems, standards, workmanship, and administrative procedures as applied to the Construction (or a specific portion of the Construction). Construction Specifications are not Contract Documents.

12. *Construction Subcontract:* A written agreement between Design-Builder and a Construction Subcontractor for provision of all or a portion of the Construction, and any delegated Design Professional Services.

13. *Construction Subcontractor:* An individual or entity (other than a Supplier) having a direct contract with Design-Builder or with any other Construction Subcontractor for the performance of a part of the Construction, and any delegated Design Professional Services.

14. *Contract:* The entire and integrated written agreement between Owner and Design-Builder concerning the Work.

15. *Contract Documents:* Those items so designated in the Agreement, and which together comprise the Contract.

16. *Contract Price:* The money that Owner has agreed to pay Design-Builder for completion of the Work in accordance with the Contract Documents.

17. *Contract Times:* The numbers of days or the dates stated in the Agreement to (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

18. *Design-Builder:* The individual or entity with which Owner has contracted for performance of the Work, as designated in the Agreement.

19. *Design Professional Services:* That part of the Work comprised of the furnishing of engineering, surveying, architecture, and other design services, and including but not limited to providing research, analysis, and conclusions regarding engineering and related matters; exercising professional judgment with respect to technical issues; the preparation of plans, reports, calculations, models, schematics, drawings, specifications, Design Submittals, the Construction Drawings, Construction Specifications, and other instruments of service; other services included in the Contract Documents and required to be performed by or under the responsible charge of licensed design professionals; and

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the review of shop drawings, observation of construction, response to requests for information or interpretation, analysis of the technical aspects of Change Orders, and other engineering and related professional services provided by or for licensed design professionals during Construction.

20. *Design Agreement:* A written agreement between Design-Builder and a design firm or entity for provision of Design Professional Services.

21. *Design Submittal:* A Submittal that pursuant to Laws and Regulations or this Contract must be prepared by or under the supervision of a licensed engineer or other licensed design professional, including drawings, specifications, Construction Drawings, Construction Specifications, and revisions to such documents (but not including Record Documents).

22. *Effective Date of the Contract:* The date indicated in the Agreement on which the Contract becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

23. *Engineer:* The Project Design Professional identified as Engineer in the Agreement, and engaged by Design-Builder to provide engineering and related professional services under a Design Agreement.

24. *Hazardous Environmental Condition:* The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations:* Any and all applicable laws, statutes, rules, regulations, ordinances, binding resolutions, codes, decrees, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens:* Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone:* A principal event in the performance of the Work that the Contract requires Design-Builder to achieve by an intermediate completion date or by a time prior to Substantial Completion of Construction.

28. *Notice of Award:* The written notice by Owner to a Proposer stating that Owner will enter into the design-build contract with the Proposer.

29. *Notice to Proceed*: A written notice by Owner to Design-Builder fixing the date on which the Contract Times will commence to run and on which Design-Builder shall start to perform the Work.

30. *Owner:* The individual or entity with which Design-Builder has contracted regarding the Work, and which has agreed to pay Design-Builder for the performance of the Work, pursuant to the terms of the Contract.

31. *Owner's Consultant:* An individual or entity with which the Owner has contracted to furnish services (typically including planning, preparation of Conceptual Documents, and

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advisory services) to Owner with respect to the Project, and which is identified as such in the Agreement.

32. *Owner's Site Representative:* A representative of Owner at the Site, as indicated in Paragraph 10.05.

33. *Project:* The total undertaking to be accomplished for Owner by engineers, consultants, Design-Builder, subcontractors, and others, including planning, study, design, construction, testing, start-up, and commissioning, and of which the Work to be performed under the Contract Documents is a part.

34. *Project Design Professionals:* The Engineer and any other independent entities or individuals, or employees of Design-Builder, engaged by Design-Builder or a Construction Subcontractor to provide Design Professional Services with respect to a portion of the Work.

35. *Proposal:* The documents submitted by Design-Builder in response to the Request for Proposals, setting forth technical concepts, proposed prices, and other conditions for the Work to be performed, and stating any proposed revisions, modifications, clarifications, exceptions, or supplements to the proposed Contract Documents.

36. *Proposal Amendment:* A Contract Document that is prepared after submittal of Design-Builder's Proposal; identifies mutually agreed revisions, modifications, exceptions, supplements, and clarifications to the Proposal or proposed Contract Documents; and is executed by Owner and Design-Builder.

37. *Proposer:* An entity that submits a Statement of Qualifications or Proposal to Owner.

38. *Record Documents:* The record copy of all Construction Drawings, Construction Specifications, Addenda, Change Orders, Work Change Directives, and approved Submittals maintained by Design-Builder at the Site, including any annotations to such documents made by Design-Builder during Construction.

39. *Record Drawings and Record Specifications:* Documents depicting the completed Project, or a specific portion of the completed Project, based on or comprised of the Record Documents delivered to Owner by Design-Builder at the completion of the Construction.

40. *Request for Proposals:* The document prepared by or for Owner specifying and describing Owner's objectives, the procedures to be followed in preparing and submitting a Proposal, and the process for evaluating Proposals and awarding a contract.

41. *Request for Qualifications:* The document prepared by or for Owner requesting that Proposers submit a Statement of Qualifications with respect to their candidacy for selection as Design-Builder.

42. *Schedule of Values:* A schedule, prepared and maintained by Design-Builder, allocating portions of the Contract Price to various portions of the Work, and used as the basis for reviewing Design-Builder's Applications for Payment.

43. *Site:* Lands or areas indicated in the Contract Documents as being furnished by Owner upon which Construction is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for use of Design-Builder.

44. *Statement of Qualifications:* The document submitted by a Proposer in response to the Request for Qualifications, including any completed forms, attachments, and exhibits.

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45. *Submittal*: A written or graphic document, prepared by or for Design-Builder, which the Contract Documents require the Design-Builder to submit to the Owner. Submittals may include reports, preliminary drawings and specifications, cost estimates, proposed Construction Drawings and Construction Specifications, progress schedules, cash flow projections, Schedules of Values, shop drawings, product data, samples, delegated designs, certifications, proposed modifications to the Construction Drawings and Construction Specifications, results of tests and evaluations, results of source quality control testing and inspections, results of field or Site quality control testing and evaluations, sustainable design information, information on special procedures, operations and maintenance data, sustainable design closeout information, record documents, records of spare parts and extra stock materials, and other such documents required by the Contract Documents. Submittals, whether approved or accepted by Owner or not, are not Contract Documents. Claims, notices, Change Orders, Applications for Payment, and requests for information/interpretation are not Submittals.

46. *Substantial Completion:* The time at which the Construction (or a specified part thereof) has progressed to the point where it is sufficiently complete, in accordance with the Contract Documents, so that the Construction (or the specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Construction refer to Substantial Completion thereof.

47. *Supplementary Conditions:* The part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier:* A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Design-Builder or with any Construction Subcontractor to furnish materials or equipment to be incorporated in the Work by Design-Builder or a Construction Subcontractor, and any lessor of rental equipment used by Design-Builder or a Construction Subcontractor during Construction at the Site.

49. *Technical Data:* Data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding (a) subsurface conditions at the Site, (b) physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), or (c) environmental conditions at the Site, that are set forth in any geotechnical or environmental report prepared for the Project and relied upon by Design-Builder in agreeing to a price (either stipulated, or a Guaranteed Maximum Price) that includes Construction.

50. *Underground Facilities:* All underground lines, pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems, including but not limited to those that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, fire or police signal systems, or traffic or other control systems; and any encasements containing such facilities or systems.

51. *Underground Facilities Data:* Information and data shown or indicated in the Contract Documents or otherwise provided to Design-Builder by Owner with respect to existing Underground Facilities at or adjacent to the Site.

52. *Unit Price Work:* Work to be paid for on the basis of unit prices.

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53. *Work:* The entire design and construction or the various separately identifiable parts thereof required to be performed or furnished by Design-Builder under the Contract Documents. Work includes and is the result of performing or furnishing Design Professional Services and Construction required by the Contract Documents and all labor, services, and documentation necessary to produce such Design Professional Services and Construction; furnishing, installing, and incorporating all materials and equipment into such Construction; and related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

54. *Work Change Directive:* A written directive to Design-Builder, issued on or after the Effective Date of the Contract, signed by Owner, ordering an addition, deletion or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B are not defined terms that require initial capital letters, but when used in the Contract Documents have the indicated meanings.

B. *Intent of Certain Terms or Adjectives:*

1. The word "day" shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

2. The word "defective," when modifying the word "Construction" refers to Construction that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to Owner's final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion) provided that the defect was not caused by Owner.

3. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

4. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials or equipment or equipment complete and ready for intended use.

5. The words "perform" or "provide" when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

6. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Design-Builder, "provide" is implied.

7. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with that meaning.

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ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds:* When Design-Builder delivers the executed Agreements to Owner, Design-Builder shall also deliver to Owner such Bonds as Design-Builder may be required to furnish in accordance with Paragraph 6.01.A.

B. *Evidence of Insurance*: Before any Work is started, Design-Builder and Owner shall each deliver to the other those certificates of insurance that Design-Builder and Owner respectively are required to purchase and maintain in accordance with Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Design-Builder four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract. Owner shall make such original printed record version of the Contract available to Design-Builder for review.

2.03 *Conceptual Documents*

A. *Design-Builder's Review of Conceptual Documents:*

1. Design-Builder acknowledges that the Conceptual Documents furnished by Owner are preliminary and incomplete, and subject to stated limitations and reservations.

2. Design-Builder shall carefully review, analyze, and verify the contents and suitability of the Conceptual Documents before proceeding with the Work (including but not limited to the Design Professional Services).

3. Design-Builder shall promptly report in writing to Owner any conflict, error, ambiguity, or discrepancy that Design-Builder may discover in the Conceptual Documents, whether during such review or at any later point.

4. Upon receipt of a report from Design-Builder that there is a conflict, error, ambiguity, or discrepancy in the Conceptual Documents, Owner shall either provide a written interpretation, clarification, or correction to Design-Builder, or authorize Design-Builder to correct or resolve the issue under a Change Order providing an equitable adjustment in Contract Times or Contract Price, or both.

5. Design-Builder shall not proceed with any Work affected by a reported conflict, error, ambiguity, or discrepancy in the Conceptual Documents until the issue is resolved.

B. Owner shall not be responsible for any deficiency in the Conceptual Documents that Design-Builder does not discover or report to Owner.

C. Subject to the foregoing review and reporting obligations, Design-Builder may use the Conceptual Documents as a partial basis for performing or furnishing Design Professional Services, including the preparation of Design Submittals such as the Construction Drawings and Construction Specifications, but despite any such use of the Conceptual Documents the Design-Builder nonetheless shall be responsible to Owner for the quality and soundness of the Design Professional Services.

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2.04 *Before Starting the Work*

A. *Preliminary Schedules:* Within 10 days after commencement of the Contract Times (unless otherwise specified in the Contract Documents), Design-Builder shall submit the following to Owner for Owner's timely review:

1. Three (3) copies of a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. A preliminary schedule of Submittals (including Design Submittals) which will list each required Submittal and the times for submitting, reviewing, and processing each Submittal;

3. A preliminary Schedule of Values for all of the Work which will include quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work; and

4. A preliminary cash flow projection estimating that portion of the Contract Price to be due during each month of performance.

2.05 *Authorized Representatives*

A. The Authorized Representative for each party has been designated in the Agreement. A party may change its Authorized Representative at any time by giving notice to the other party of the name, mailing and delivery addresses, e-mail address, and telephone numbers of the new Authorized Representative.

2.06 *Initial Conference*

A. Within 20 days after the Contract Times start to run, Design-Builder will arrange a conference attended by Owner and Design-Builder and others as appropriate to establish a working understanding among the parties as to the Work and to discuss the design concepts, schedules referred to in Paragraph 2.04.A, procedures for handling Submittals, processing Applications for Payment, maintaining required records, and other matters.

2.07 *Review of Schedules*

A. Not less than 10 days before submission of the first Application for Payment (unless otherwise provided in the Contract Documents), Design-Builder will arrange a conference attended by Design-Builder, Owner, and others as appropriate to review and discuss the schedules submitted in accordance with Paragraph 2.04.A. Design-Builder shall have an additional 10 days after the conference to make corrections and adjustments and to complete and resubmit the schedules for Owner's acceptance. No progress payment shall be made to Design-Builder until Design-Builder submits schedules that comply with the following requirements:

1. Design-Builder's progress schedule shall provide an orderly progression of the Work to completion within any specified Milestones and the Contract Times.

2. Design-Builder's schedule of Submittals shall provide a workable arrangement for submitting, reviewing, and processing Submittals in accordance with Article 8.

3. Design-Builder's Schedule of Values shall provide a reasonable allocation of the Contract Price to component parts of the Work.

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2.08 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Design-Builder may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. Electronic Documents Protocol: The parties shall conform to the following provisions in Paragraphs 2.08.B and 2.08.C, together referred to as the Electronic Documents Protocol ("EDP" or "Protocol") for exchange of electronic transmittals.

1. Basic Requirements

a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.

b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.

c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.

d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.

e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.

f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 17.01 of the General Conditions.

2. System Infrastructure for Electronic Document Exchange

a. Owner will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum

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standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.

1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 7 MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.

2) 2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.

b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.

c. Each party will operate and maintain industry-standard, industry-accepted, ISO standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.

d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.

e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.

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g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.

h. The Owner will operate a Project information management system (also referred to in this EDP as "Project Website") for use of Owner, Engineer and Design-Builder during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this EDP or the General Conditions, use of the Project Website by the parties as described in this Paragraph will be mandatory for exchange of Project documents, communications, submittals, and other Project-related information. The following conditions and standards will govern use of the Project Website:

1) Describe the period of time during which the Project Website will be operated and be available for reliance by the parties;

2) Provide any minimum system infrastructure, software licensing and security standards for access to and use of the Project Website;

3) Describe the types and extent of services to be provided at the Project Website (such as large file transfer, email, communication and document archives, etc.); and

4) Include any other Project Website attributes that may be pertinent to Design-Builder's use of the facility and pricing of such use.

C. Software Requirements for Electronic Document Exchange; Limitations

1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.

a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.

2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.

3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

D. Requests by Design-Builder for Electronic Documents in Other Formats

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.

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2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Design-Builder ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Design-Builder agrees:

    a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer's purposes solely, and is being provided to Design-Builder on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Design-Builder is advised and acknowledges that the content may not be suitable for Design-Builder's application, or may require substantial modification and independent verification by Design-Builder. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

    b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Design-Builder under the request are only for convenience of Design-Builder. Any conclusion or information obtained or derived from such data will be at the Design-Builder's sole risk and the Design-Builder waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.

    c. Design-Builder shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Design-Builder's use, adaptation, or distribution of any Electronic Documents provided under the Request.

    d. Design-Builder agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Design-Builder's subcontractors. Design-Builder warrants that subsequent use by Design-Builder's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.

3. In the event that Owner elects to provide or directs the Engineer to provide to Design-Builder any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Design-Builder, the Owner shall be reimbursed by Design-Builder on an hourly basis at $250 per hour for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

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ARTICLE 3 – DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Contract Documents*

A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. It is the intent of the Contract Documents to require the design and construction of a functionally complete project (or part thereof).

C. Design-Builder shall prepare or furnish Construction Drawings and Construction Specifications that are in accord with the Contract Documents and that describe a functionally complete Project (or part thereof) to be constructed in accordance with such Construction Drawings and Construction Specifications, as duly modified.

D. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

E. Design-Builder will furnish or perform all labor, documentation, services (including professional services), materials, and equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result whether or not specifically called, for at no additional cost to Owner.

3.02 *Reference Standards*

A. *Standards, Specifications, Codes, Laws or Regulations:*

1. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect on the Effective Date except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or instruction of a Supplier, shall be effective to change the duties and responsibilities of Owner, Design-Builder, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Owner or its officers, directors, members, partners, employees, agents, consultants, or subcontractors any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Resolving Discrepancies*

A. If there is a discrepancy between (1) the Conceptual Documents or other Contract Documents issued with the Request for Qualifications or Request for Proposals and (2) the Proposal, the Proposal will control.

B. If there is a discrepancy between (1) the Conceptual Documents, other Contract Documents issued with the Request for Qualifications or Request for Proposals, or the Proposal and (2) the Proposal Amendment, the Proposal Amendment will control.

C. If there is a discrepancy between (1) the Contract Documents and (2) the Construction Drawings and Construction Specifications, the Contract Documents will control unless Design-Builder gave notice of the discrepancy in a Submittal, and Owner approved the Submittal, pursuant to the provisions of Article 8.

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3.04 *Ownership and Reuse of Documents*

A. All documents prepared for or furnished to Owner by Design-Builder pursuant to this Contract (including but not limited to Design Submittals) are instruments of service. With respect to such documents:

1. Design-Builder shall have and retain the ownership, title, and property rights, including copyright, patent, intellectual property, and common law rights, in the documents.

2. During the course of the Project, Design-Builder will provide copies of Design Submittals to Owner for purposes of review and comment. Owner may retain copies of such documents for its records.

3. Owner may use its copy of the Record Drawings and Record Specifications for Owner's purposes in operating and maintaining the constructed facilities.

4. Upon Owner's termination of this Contract for cause pursuant to Paragraph 15.02, Owner shall receive a limited, non-exclusive license to use any completed Design Submittals in continuing the Project, subject to the limitations in this Paragraph 3.04.

5. The documents prepared or furnished by Design-Builder under this Contract, regardless of ownership, transfer, license, completion status, or termination of the Contract, are for Design-Builder's use, and are not intended or represented to be suitable for use on the Project by Owner or any party other than Design-Builder, or for reuse by Owner or others on extensions of the Project or on any other project, except as otherwise stated in this Contract. Any use or reuse by Owner or others on Owner's behalf will be at Owner's sole risk, and without liability or legal exposure to Design-Builder, the Project Design Professionals, or their subconsultants, and Owner shall indemnify and hold harmless Design-Builder, the Project Design Professionals, and their subconsultants from all claims, damages, losses and expenses, including attorneys' fees, arising out of or resulting from any such use or reuse.

3.05 *Order of Precedence of Contract Documents*

A. In resolving conflicts resulting from errors or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

1. Permits from other agencies as may be required by law;

2. Addenda, Supplemental Agreements and Change Orders, the one dated later having the precedence over another dated earlier;

3. Agreement;

4. Owner's Special Provisions;

5. General Conditions (Section 00700);

6. General Requirements (Sections 01010 through 01999);

7. Other Technical Specifications (Section 02000 and all other Sections following);

8. Drawings;

9. Instructions to Bidders;

10. Bid Forms;

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11. Invitation to Bid.

B. With reference to the Drawings, the order of precedence is as follows:

1. Enumerated dimensions govern over scaled dimensions
2. Detail drawings govern over general drawings
3. Addenda/Change Order drawings govern over any other drawings
4. Contract Drawings govern over standard drawings/plans
5. Specific notes take precedence over schedules
6. Notes, descriptions or schedules take precedence over graphic representations

C. The provisions of the Contract Documents shall take precedence over any Laws or Regulations applicable to the performance of the work unless such an interpretation of the provisions of the Contract Documents would result in a violation of such Law or Regulation.

3.06 *American Iron and Steel (AIS) Requirements*

A. The Design-Builder acknowledges to and for the benefit of the City of Sweet Home ("Purchaser") and the State of Oregon (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Design-Builder pursuant to this Agreement. The Design-Builder hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Design-Builder has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Design-Builder will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Design-Builder shall permit the Purchaser or State to recover as damages against the Design-Builder any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Design-Builder has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Design-Builder agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times*

A. The Contract Times will commence to run on the Effective Date of the Contract.

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4.02 *Starting the Work*

A. Design-Builder shall start to perform the Work as of the Effective Date of the Contract. No Construction shall be done at the Site prior to the Effective Date of the Contract.

4.03 *Progress Schedule*

A. Owner may rely on the progress schedule established in accordance with Paragraph 2.04, as duly adjusted, in planning and conducting ongoing operations and other work at the Site.

B. Design-Builder shall adhere to the progress schedule established in accordance with Paragraph 2.04 as it may be adjusted from time to time, as provided below:

1. Once each month, prior to the processing of the monthly progress payment, Design-Builder shall submit to the Engineer and Owner proposed adjustments in the progress schedule that will not change the Contract Times (or Milestones). Updates must accurately reflect as-built schedule. Owner shall accept such adjustments provided that Owner, in planning and conducting ongoing operations and other work at the Site, has not reasonably relied on the schedule element that is proposed to be adjusted. If Owner has so relied, then Owner and Design-Builder shall promptly meet and seek a resolution that addresses the objectives of both parties, or adjust the Contract Price.

2. In addition, a three-week rolling "look-ahead" schedule shall be updated and provided to the Engineer at the beginning of each work week. The two-week rolling schedule shall include the Design-Builder's proposed daily activities and location(s) of work during the coming two-week period. No work shall commence at the beginning of each workweek until the updated two-week rolling schedule is submitted. During the contract period, the Design-Builder shall also coordinate his activities daily with the Engineer.

3. Design-Builder shall submit proposed adjustments in the progress schedule that will change the Contract Times (including Milestones) in accordance with the requirements of Paragraph 11.06. Such adjustments may only be made by a Change Order.

C. *Continuing the Work:* Design-Builder shall continue the Work and adhere to the progress schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as Design-Builder and Owner may otherwise agree in writing.

4.04 *Delays in Design-Builder's Progress*

A. If Owner or anyone for whom Owner is responsible delays, disrupts, or interferes with the performance or progress of the Work, then Design-Builder shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Design-Builder's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times.

B. Design-Builder shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference within the control of Design-Builder. Delay, disruption, and interference attributable to and within the control of a Project Design Professional, Construction Subcontractor, or Supplier shall be deemed to be delays within the control of Design-Builder.

C. If Design-Builder's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Design-Builder, and

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those for which they are responsible, then Design-Builder shall be entitled to an equitable adjustment in Contract Times. Design-Builder's entitlement to such an adjustment of the Contract Times is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times. Such an adjustment shall be Design-Builder's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
2. Abnormal weather conditions;
3. Acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 9); and
4. Acts of war or terrorism.
5. Weather-Related Delays
    a. If "abnormal weather conditions" as set forth in Paragraph 4.04.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.
    b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:
        1) Every workday on which one or more of the following conditions exist will be considered a "bad weather day":
            i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds 1.0 inches of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC 4.05.C by reference.
            ii) Ambient outdoor air temperature for 60 minutes between the hours of 10:00 a.m. and 3:00 p.m. is equal to or less than the following low temperature threshold: 15 degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: 100 degrees Fahrenheit.
        2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by the City of Sweet Home Public Works Department.
        3) Design-Builder shall anticipate the number of foreseeable bad weather days per month indicated in the table below —Foreseeable Bad Weather Days.

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4) Design-Builder shall include the following Foreseeable Bad Weather Days in the Progress Schedule as follows:

i) January – 3 Days

ii) February – 2 Days

iii) March – 1 Day

iv) April – 1 Days

v) May – 0 Days

vi) June – 0 Days

vii) July – 1 Days

viii) August – 2 Days

ix) September – 1 Days

x) October – 1 Day

xi) November – 2 Days

xii) December – 3 Days

5) In each month, every bad weather day exceeding the number of Foreseeable Bad Weather Days will be considered as "abnormal weather conditions." The existence of abnormal weather conditions will not relieve Design-Builder of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Design-Builder's then-current Progress Schedule's critical path for the Project.

6) If mutually agreed upon by Owner and Design-Builder, working hours during days with anticipated abnormal weather periods can be adjusted to allow work earlier or later in the day depending on the type of abnormal weather expected.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 9.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Design-Builder shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Design-Builder.

G. If Design-Builder seeks an adjustment in Contract Price or Contract Times under this paragraph, Design-Builder shall submit a request for a Change Order to Owner within 30 days of the commencement of the delaying, disrupting, or interfering event.

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ARTICLE 5 – SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Design-Builder of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Design-Builder will have to comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Design-Builder with a current statement of record legal title and legal description of the lands upon which the Construction is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws or Regulations.

C. Design-Builder shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Design-Builder shall confine construction equipment, the storage of materials and equipment and operations of workers to the work and staging areas as shown on the drawings and shall not unreasonably encumber the site and other areas with construction equipment or other materials or equipment. Design-Builder shall be responsible for keeping driveways and other main access points to the site open. Design-Builder shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work. Use of additional areas onsite or offsite may be allowed if authorized in writing by the Owner.

2. Should any claim be made by any such owner or occupant because of the performance of Work, Design-Builder shall promptly settle with such other party by negotiation, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law.

3. To the fullest extent permitted by Laws or Regulations, Design-Builder shall indemnify and hold harmless Owner, Owner's consultants, and anyone directly or indirectly employed by any of them from and against all claims, costs, losses and damages (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration or other dispute resolution costs) arising out of or resulting from any claim brought by any such owner or occupant against Owner, or any other party indemnified hereunder to the extent caused by or based upon Design-Builder's performance of the Construction.

B. *Removal of Debris:* During the performance of the Construction, Design-Builder shall keep the premises free from accumulations of waste materials, rubbish, and other debris resulting from the Construction. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws or Regulations.

C. *Cleaning:* Prior to Substantial Completion, Design-Builder shall clean the Site and make it ready for utilization by Owner. At completion of Construction, Design-Builder shall remove all tools, appliances, construction equipment, temporary construction and machinery, and

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surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Design-Builder shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Design-Builder subject any part of the Construction or adjacent property to stresses or pressures that will endanger it.

5.03 *Reference Points*

A. Design-Builder shall be responsible for laying out the Work and shall protect and preserve reference points and property monuments established by Owner, and shall make no changes or relocations of such reference points or monuments without the prior written approval of Owner. Design-Builder shall report to Owner whenever any reference point or property monument is lost or destroyed, or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

5.04 *Differing Site Conditions*

A. Design-Builder shall promptly, and before the conditions are disturbed, give a written notice to Owner of (i) subsurface or latent physical conditions at the Site (whether discovered during investigation of the Site or during Construction) which differ materially from those indicated in the Contract Documents, or in any Technical Data, or (ii) unknown physical conditions at the Site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character called for by the Contract Documents.

B. Owner will investigate the Site conditions promptly after receiving the notice. Design-Builder shall supplement the notice by promptly submitting to Owner any additional information regarding schedule and cost impacts, and a specific request for a Change Order. Owner shall then make a determination regarding the site condition and the impact, if any, on Contract Price and Contract Times. If the conditions do materially so differ and cause an increase or decrease in the Design-Builder's cost of, or the time required for, performing any part of the Work, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the Contract Price or Times modified in writing by Change Order in accordance with Article 11.

C. No request by Design-Builder for an equitable adjustment under this Paragraph 5.04 shall be allowed unless Design-Builder has given the written notice required.

D. The provisions of this Paragraph 5.04 are not intended to apply to a Hazardous Environmental Condition or Underground Facility uncovered or revealed at the Site.

5.05 *Underground Facilities*

A. *Procedure for Identifying Underground Facilities:* Promptly after the Effective Date of the Contract, Design-Builder shall review the Underground Facilities Data furnished by Owner and use ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data," as a basis for establishing a procedure ("Underground Facilities Procedure") for the further identification, investigation, and mapping of Underground Facilities at or adjacent to the Site. Design-Builder shall establish and use the Underground Facilities Procedure to aid in the provision of Design Professional Services and the performance of Construction, and to

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reduce and manage risks associated with Underground Facilities. Such Underground Facilities Procedure shall take into account the Site and the nature of the Project.

1. The Underground Facilities Procedure shall include a plan to keep Underground Facilities information current as Design-Builder proceeds with the provision of Design Professional Services, and to add new or relocated Underground Facilities information to the base utility or Site drawings.

2. To manage the potential impact of design changes on Underground Facilities, Design-Builder shall modify or reapply the Underground Facilities Procedure as the design progresses and changes.

B. *Design-Builder's Responsibilities:* Unless otherwise expressly provided in the Contract, Design-Builder shall have full responsibility for the following; and, subject to the provisions of Paragraphs 5.05.C, D, and E, the cost of all of the following will be included in the Contract Price:

1. Establishing and executing the Underground Facilities Procedure referred to in Paragraph 5.05.A, including updating, modification, and reapplication duties;

2. Coordinating the Work with the owners (including Owner) of such Underground Facilities, during the provision of Design Professional Services and Construction;

3. Verifying the actual location of specific Underground Facilities through exposure, as needed for the Design Professional Services;

4. Complying with applicable state and local utility damage prevention Laws and Regulations during Construction; and

5. The safety and protection of all existing Underground Facilities at the Site, and repairing any damage to such Underground Facilities resulting from the Construction, subject to the provisions of Paragraph 5.05.D.

C. *Results of Design-Builder's Execution of Underground Facilities Procedure:* If, during the execution of the Underground Facilities Procedure referred to in Paragraph 5.05.A, the Design-Builder identifies an Underground Facility that was not shown or indicated in the Underground Facilities Data, or was not shown or indicated with reasonable accuracy, causing an increase or decrease in the Design-Builder's cost of, or the time required for, providing Design Professional Services or performing the Construction, then Design-Builder shall submit to Owner a request for a Change Order seeking an equitable adjustment to the Contract Price or Times under this clause. Such request shall be made within 30 days of the identification of the Underground Facility in question.

D. *Underground Facility Found During Construction*: If Design-Builder believes that an Underground Facility that is uncovered, exposed, or revealed at the Site during Construction was not shown or indicated in the Underground Facilities Data, or was not shown or indicated with reasonable accuracy, and also that such Underground Facility was not identified or mapped with reasonable accuracy despite Design-Builder's adequate establishment and execution of the Underground Facilities Procedure referred to in Paragraph 5.05.A, then Design-Builder shall promptly give written notice to Owner, and supplement the notice by submitting to Owner a request for a Change Order seeking an equitable adjustment to the Contract Price or Times under this clause. Such request shall be made within 30 days of the uncovering or revealing of the Underground Facility in question.

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1. *Owner's Review:* Owner will investigate the Underground Facility found during Construction promptly after receiving the notice. If Owner concurs with Design-Builder that the Underground Facility that is uncovered, exposed, or revealed at the Site was not shown or indicated in the Underground Facilities Data, or was not shown or indicated with reasonable accuracy, and further was not identified or mapped with reasonable accuracy despite Design-Builder's adequate establishment and execution of the Underground Facilities Procedure referred to in Paragraph 5.05.A, causing an increase or decrease in the Design-Builder's cost of, or the time required for, performing any part of the Work, whether or not changed as a result of the actual location, then an equitable adjustment shall be made under this clause and the Contract Price or Times modified in writing by Change Order in accordance with Article 11. If Owner does not concur with Design-Builder, then Owner shall so indicate in writing, with a specific explanation of the reason for non-concurrence.

2. No request by Design-Builder for an equitable adjustment under Paragraph 5.05.D shall be allowed unless Design-Builder has given the written notice required.

E. *Inadequate Establishment or Execution of Underground Facilities Procedure:* If Design-Builder does not establish an Underground Facilities Procedure that is (1) adequate for the Site and the nature of the Project and (2) consistent with the guidelines set forth in ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data," or Design-Builder does not adequately execute a duly established Underground Facilities Procedure, then Design-Builder shall bear all costs associated with the presence of an Underground Facility that was not identified or located with reasonable accuracy, including but not limited to delay, redesign, relocation, and increased Construction costs, if such Underground Facility would have been identified and located with reasonable accuracy by an adequate and properly executed Underground Facilities Procedure that was consistent with ASCE 38.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reliance by Design-Builder on Technical Data Authorized:* Design-Builder may rely on the accuracy of the Technical Data with respect to environmental conditions at the Site.

B. Design-Builder shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

C. Design-Builder shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Design-Builder, Project Design Professionals, Construction Subcontractors, Suppliers, or anyone else for whom Design-Builder is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

D. If Design-Builder encounters, uncovers, or reveals a Hazardous Environmental Condition (whether during Site investigation or during Construction) whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Design-Builder or anyone for whom Design-Builder is responsible creates a Hazardous Environmental Condition, then Design-Builder shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.16); and (3) notify

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Owner (and promptly thereafter confirm such notice in writing). Owner shall promptly determine whether to retain a qualified expert to evaluate such condition or take corrective action, if any, and take such actions as are necessary to permit Owner to timely obtain required permits and provide Design-Builder the written notice required by Paragraph 5.06.E. If Design-Builder or anyone for whom Design-Builder is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

E. Design-Builder shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Design-Builder either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

F. If after receipt of such written notice Design-Builder does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then the portion of the Work that is in the area affected by such condition shall be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 9.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Design-Builder, Project Design Professionals, Construction Subcontractors, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Contract Documents or the Technical Data, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Design-Builder or by anyone for whom Design-Builder is responsible. Nothing in this Paragraph 5.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Design-Builder shall indemnify and hold harmless Owner and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the Design-Builder's failure to control, contain, or remove a Constituent of Concern brought to the Site by Design-Builder or by anyone for whom Design-Builder is responsible, or to a Hazardous Environmental Condition created by Design-Builder or by anyone for whom Design-Builder is responsible. Nothing in this Paragraph 5.06.H shall obligate Deign-Builder to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

5.07 *Reports and Drawings*

A. The following drawings and reports are available for the Design-Builder:

1. Record Drawings for the Sweet Home Wastewater Treatment Plant.

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a. Contract Documents dated June 1973 consisting of 2 volumes, prepared by CH2M Hill, entitled " Sweet Home Wastewater Treatment Plant".

b. Construction Documents dated October 1992, prepared by Kramer Chin and Mayo, entitled "City of Sweet Home Wastewater Facilities Improvements".

c. Contract Documents dated February 1997, prepared by HGE, Inc., entitled "City of Sweet Home Wastewater Treatment Plant Improvements".

2. Site surveying completed by Udell Engineers located in Lebanon, Oregon.

3. Geotechnical Data Report (GDR) prepared by McMillen Jacobs Associates, Final dated June 2022.

4. 4No other information on existing subsurface or physical conditions is available for the Contractor.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Bonds shall be furnished in accordance with the City of Sweet Home Contract requirements. These shall include, but not be limited to, performance bond and payment bond.

1. Required Performance Bond Form: The performance bond that Contractor furnishes will be in the form of EJCDC® D 610, Performance Bond (2009 or 2016 edition).

2. Required Payment Bond Form: The payment bond that Contractor furnishes will be in the form of EJCDC® D 615, Payment Bond (2009 or 2016 edition).

B. Design-Builder shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Design-Builder's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due, or until completion of the correction period specified in Paragraph 14.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other specific provisions of the Contract. Design-Builder shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

1. Contractor shall furnish an exhibit of their warranty guarantee.

C. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Design-Builder shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

E. If the surety on a bond furnished by Design-Builder is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the

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Project is located, or the surety ceases to meet the requirements above, then Design-Builder shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

F. If Design-Builder has failed to obtain a required bond, Owner may exclude the Design-Builder from the Site and exercise Owner's termination rights under Article 15.

G. Upon request to either Owner or Design-Builder from any Construction Subcontractor, Project Design Professional, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, the recipient of the request shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Design-Builder shall obtain and maintain insurance as required in this Article and City of Sweet Home Special Provisions.

B. Design-Builder's insurance required by the Contract shall be primary over Owner's insurance and shall include a waiver of subrogation against Owner and Engineer.

C. All insurance required by the Contract to be purchased and maintained by Owner or Design-Builder shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

D. All insurance required by the Contract to be purchased and maintained by Design-Builder shall be primary and without contribution by insurance maintained by Owner.

E. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract.

F. Design-Builder shall require (a) its Construction Subcontractors and Engineer (and any other Project Design Professional that is an independent individual or entity) to purchase and maintain commercial general liability, automobile liability, workers' compensation, employer's liability, professional liability (as applicable), and umbrella or excess liability insurance, and (b) its Construction Subcontractors to purchase and maintain contractor's pollution liability insurance. All such required insurance shall meet the same requirements for the applicable category of insurance established in this Contract for Design-Builder, unless otherwise indicated in the Supplementary Conditions.

G. Design-Builder shall deliver to Owner, with copies to each additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Design-Builder has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Design-Builder shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, documentation of applicable self-insured retentions (if permitted) and deductibles, and evidence of insurance required to be purchased and maintained by Design-Builder's Construction Subcontractors, Engineer, and any other Project Design Professional that is an independent individual or entity. Design-

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Builder may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

H. Owner shall deliver to Design-Builder, with copies to each additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Design-Builder or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

I. Failure of Owner or Design-Builder to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Design-Builder to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

J. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

K. If Design-Builder has failed to obtain and maintain required insurance, Owner may exclude the Design-Builder from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 15.

L. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

M. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Design-Builder or Design-Builder's interests.

N. The insurance and insurance limits required herein shall not be deemed as a limitation on Design-Builder's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Design-Builder's Insurance*

A. Required Insurance: Design-Builder shall purchase and maintain Worker's Compensation, Commercial General Liability, Builders Risk and other insurance pursuant to the specific requirements set forth herein.

B. General Provisions: The policies of insurance required by this Paragraph 6.03 must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 14.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty

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or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Design-Builder, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. Additional Insureds: The Design-Builder's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds the following:

a. OWNER: "City of Sweet Home, its officers, employees, agents, and consultants"; AND

b. ENGINEER: "West Yost Associates Inc., its officers, employees, agents, and consultants"; AND

c. any individuals or entities identified as additional insureds herein.

2. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

3. not seek contribution from insurance maintained by the additional insured; and

4. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Design-Builder's acts or omissions, or the acts and omissions of those working on Design-Builder's behalf, in the performance of Contractor's operations.

D. *Other Additional Insureds*: As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds the Owner and Engineer.

E. *Workers' Compensation and Employer's Liability Insurance:* Design-Builder shall purchase and maintain Worker's Compensation and Employer's Liability Insurance. This insurance shall protect Design-Builder against all claims under applicable state workers' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. Design-Builder shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This policy shall include an "all states" or "other states" and waiver of subrogation endorsements. The liability limits, as required by state law shall be not less than:

1. Workers' Compensation: Statutory

2. Employer's Liability: $1,000,000 each occurrence

F. Commercial General Liability—Claims Covered: Design-Builder shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Design-Builder, on an occurrence basis, against claims for:

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1. damages because of bodily injury, sickness or disease, or death of any person other than Design-Builder's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Design-Builder's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.
    a. Such insurance must be maintained for three years after final payment.
    b. Design-Builder shall furnish Owner and each other additional insured (as identified in the General Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.19.
3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
4. Underground, explosion, and collapse coverage.
5. Personal injury coverage.
6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Design-Builder demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. Commercial General Liability Insurance Coverage: This insurance shall be occurrence type written in comprehensive form and shall protect DESIGN-BUILDER, OWNER, and ENGINEER as additional insureds, against claims arising out of performance of the Work. The policy shall also include personal injury liability coverage, contractual liability coverage, completed operations and products liability coverage, and coverage for blasting, explosion, collapse of buildings, and damage to underground property. The liability limits for bodily injury and property damage shall be not less than:

1. Combined Single Limit for each occurrence: $2,000,000
2. General aggregate: $2,000,000

I. Automobile Liability: Design-Builder shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

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Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	$1,000,000
Each Accident	$1,000,000
Property Damage	
Each Accident	$1,000,000
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$2,000,000

J. Umbrella Liability Insurance: Design-Builder shall purchase and maintain umbrella liability insurance. This insurance shall protect DESIGN-BUILDER, OWNER, and ENGINEER as additional insureds, against claims in excess of the limits provided under workers' compensation and employer's liability, comprehensive automobile liability, and commercial general liability policies. The umbrella policy shall follow the form of the primary insurance, including the application of the primary limits. The liability limits for bodily injury and property damage shall be not less than:

1. Combined Single Limit for each occurrence: $5,000,000
2. General aggregate: $5,000,000

K. Pollution Liability Insurance: If not otherwise included in the Design-Builder's Commercial General Liability Insurance coverage, Design-Builder shall purchase and maintain pollution liability insurance for claims arising from the discharge, dispersal, release, escape of any irritant or contaminant into or upon land, any structure, the atmosphere, watercourse, or body of water including groundwater. This shall include coverage for claims of: (a) clean up, either on-site or off site; (b) third party liability, including bodily injury, property damage, natural resource damage, third party property loss of use/revenue, and clean up; and/or (c) costs incurred for regulatory fines and/or the investigation, defense, or settlement of claims. The liability limits for pollution shall not be less than:

1. Combined Single Limit for each occurrence: $5,000,000
2. General aggregate: $5,000,000

L. Railroad Protective Liability Insurance: Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Design-Builder shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Owner, and (4) submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Owner of such submittal.

Railroad Protective Liability Insurance	Policy limits of not less than:
Each Claim	$ 1,000,000
Aggregate	$ 2,000,000

M. Unmanned Aerial Vehicle Liability Insurance: If Design-Builder uses unmanned aerial vehicles (UAV—commonly referred to as drones) at the Site or in support of any aspect of the Work, Design-Builder shall obtain UAV liability insurance in the amounts stated; name Owner, Engineer, and all individuals and entities identified in the General Conditions as additional

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insureds; and provide a certificate to Owner confirming Design-Builder's compliance with this requirement. Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy.

Unmanned Aerial Vehicle Liability Insurance	Policy limits of not less than:
Each Claim	$ 100,000
General Aggregate	$ 250,000

6.04 *Builder's Risk and Other Property Insurance*

A. Builder's Risk: Design-Builder shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the General Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the General Conditions.

B. Property Insurance for Facilities of Owner Where Work Will Occur: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. Property Insurance for Substantially Complete Facilities: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. Partial Occupancy or Use by Owner: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Design-Builder) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. Insurance of Other Property; Additional Insurance: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Design-Builder elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Design-Builder's expense.

F. Builder's Risk Requirements: The builder's risk insurance must:

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1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

    a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

    b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Design-Builder.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).

4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier). If this coverage is subject to a sublimit, such sublimit will be a minimum of $2,000,000.

5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of $2,000,000.

6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.

7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.

8. include performance/hot testing and start-up, if applicable.

9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.

10. include as named insureds the Owner, Design-Builder, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such

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builder's risk policy. Parties required to be insured will be referred to collectively as "insureds." In addition to Owner, Design-Builder, and Subcontractors of every tier, include as insureds the following:

a. West Yost Associates, Inc.

Charles Duncan, President
2020 Research Park Drive, Suite 100
Davis, CA 95618
503.756.5905; CDuncan@westyost.com

11. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of $5,000,000.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained, at Contactor's expense, in accordance with Paragraph 6.04 (or an installation floater policy if authorized), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Design-Builder waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the General Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Design-Builder as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Design-Builder, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Design-Builder, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and

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subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Design-Builder shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Design-Builder, all individuals or entities identified in the General Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the Design-Builder and Owner. Design-Builder and Owner shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer to the Design-Builder and Owner as the fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. Design-Builder and Owner receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Design-Builder shall repair or replace the damaged Work, using allocated insurance proceeds

ARTICLE 7 – DESIGN-BUILDER'S RESPONSIBILITIES

7.01 *Design Professional Services*

A. Design-Builder shall provide the Design Professional Services needed to successfully perform and complete the Work required under this Contract.

B. *Standard of Care:* The standard of care for all Design Professional Services performed or furnished by Design-Builder under this Contract will be the care and skill ordinarily used by members of the subject profession practicing under similar circumstances at the same time and in the same locality.

7.02 *Construction*

A. Design-Builder shall perform and furnish the Construction pursuant to the Contract Documents, the Construction Drawings, and the Construction Specifications, as duly modified.

B. Design-Builder shall keep Owner advised as to the progress of the Construction.

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7.03 *Supervision and Superintendence of Construction*

A. Design-Builder shall supervise, inspect, and direct the Construction competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to provide the Construction in accordance with the Contract Documents. Design-Builder shall be solely responsible for the means, methods, techniques, sequences, and procedures of Construction.

B. At all times during the progress of Construction, the Design-Builder shall assign a competent resident superintendent who shall not be replaced without written notice to Owner except under extraordinary circumstances.

7.04 *Labor; Working Hours*

A. Design-Builder shall provide competent, suitably qualified personnel to perform the Work as required by the Contract Documents. Design-Builder shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise indicated in the Contract Documents, and in the absence of any Laws or Regulations to the contrary, Design-Builder may perform the Construction on legal holidays, during any or all hours of the day, and on any or all days of the week, at Design-Builder's sole discretion.

7.05 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Design-Builder shall furnish or cause to be furnished and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified by Owner or in the Construction Drawings or Construction Specifications, and unless specified otherwise shall be new and of good quality. All warranties and guarantees specifically called for by the Contract Documents shall expressly run to the benefit of Owner. If required by Owner, Design-Builder shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

7.06 *"Or Equals" and Substitutions*

A. If an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, then during the preparation of the proposed Construction Drawings and Construction Specifications, the Design-Builder may request that Owner authorize the use of other items of material or equipment, or items from other proposed suppliers, by including the proposed items in the proposed Construction Drawings or Construction Specifications, with required notice to Owner that the Submittal contains a variation from the Contract Documents. Owner in its sole discretion may approve the use of the item if Owner determines that the item is functionally

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equal to that named and sufficiently similar so that no change in related Work will be required, taking into consideration whether the item:

1. Is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
2. Will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
3. Has a proven record of performance and availability of responsive service; and
4. Is not objectionable.

B. *Effect of Owner's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

C. *Substitutes:* During the preparation of the proposed Construction Drawings and Construction Specifications, the Design-Builder may propose a substitute to an item of material or equipment that is required to be furnished by the Contract Documents. Any such proposal shall be made in a transmittal to Owner that is separate from and independent of any Design Submittals. The proposal shall describe the advantages, disadvantages, and changes in Contract Price or Contract Time associated with the proposed substitute. Approval of the proposed substitute shall be at Owner's sole discretion. If approved, the substitute item shall be incorporated in the Construction Drawings and Construction Specifications.

D. *Design Professional Review:* Before Design-Builder transmits its proposal to Owner, the Project Design Professional that designed the portion of the Work affected by the proposed "or equal" or substitute shall review and approve the proposal.

E. *Construction Drawings and Construction Specifications:* "Or equal" or substitute proposals with respect to items of material or equipment that are required in the Construction Drawings and Construction Specifications shall be considered proposed modifications of the Construction Drawings and Construction Specifications, and shall be governed by the provisions of Paragraph 8.02.H.

7.07 *Concerning Project Design Professionals, Construction Subcontractors, Suppliers, and Others*

A. Design-Builder may retain Project Design Professionals, Construction Subcontractors, and Suppliers for the performance of parts of the Work. Such Project Design Professionals, Construction Subcontractors, and Suppliers must be acceptable to Owner.

B. Design-Builder shall retain specific Project Design Professionals, Construction Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required to do so by the Contract Documents (including but not limited to the Proposal Amendment) as of the Effective Date.

C. Prior to entry into any binding Design Agreement, Construction Subcontract, or purchase order, Design-Builder shall submit to Owner the identity of the proposed Project Design Professional, Construction Subcontractor, or Supplier (unless Owner has already deemed such proposed contractual party acceptable, during the bidding process or otherwise). Such proposed contractual party shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

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D. Owner may require the replacement of any Project Design Professional, Construction Subcontractor, Supplier, or other entity retained by Design-Builder to perform any part of the Work solely on the basis of substantive, reasonable objection after due investigation. Design-Builder shall submit an acceptable replacement for the rejected Project Design Professional, Construction Subcontractor, Supplier, or other entity.

E. If Owner requires the replacement of any Project Design Professional, Construction Subcontractor, Supplier, or other entity retained by Design-Builder to perform any part of the Work, then Design-Builder shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement.

F. No acceptance by Owner of Engineer or of any Project Design Professional, Construction Subcontractor, Supplier, or other entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

G. Design-Builder shall be fully responsible to Owner for all acts and omissions of the Project Design Professionals, Construction Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work, just as Design-Builder is responsible for Design-Builder's own acts and omissions.

H. Design-Builder shall be solely responsible for scheduling and coordinating the services and work of the Project Design Professionals, Construction Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

I. Design-Builder shall restrict all Project Design Professionals, Construction Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating directly with Owner, except in case of an emergency or a matter involving public health, safety, or welfare, or as otherwise expressly allowed herein.

J. Owner may furnish to any Project Design Professional, Construction Subcontractor, or Supplier, to the extent practicable, information about amounts paid to Design-Builder on account of Work performed for Design-Builder by the requesting party.

K. Nothing in the Contract Documents:

1. Shall create for the benefit of any Project Design Professional, Construction Subcontractor, Supplier, or other third-party individual or entity any contractual relationship between Owner and such third-party individual or entity; nor

2. Shall create any obligation on the part of Owner to pay or to see to the payment of any money due any Project Design Professional, Construction Subcontractor, Supplier, or other third-party individual or entity except as may otherwise be required by Laws and Regulations.

7.08 *Patent Fees and Royalties*

A. Design-Builder shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Conceptual Documents or other Contract Documents for use in the performance of the Construction, and if to the actual knowledge of Owner its use is subject to patent rights or copyrights calling for

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the payment of any license fee or royalty to others, then Owner has disclosed the existence of such rights to Design-Builder in the Conceptual Documents or other Contract Documents.

B. To the fullest extent permitted by Laws or Regulations, Design-Builder shall indemnify and hold harmless Owner and Owner's Consultant, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the specification or incorporation in the Work of any invention, design, process, product or device, except those required by the Contract Documents.

C. To the fullest extent permitted by Laws or Regulations, Owner shall indemnify and hold harmless Design-Builder and its officers, directors, members, partners, employees or agents, Project Design Professionals, Construction Subcontractors, and Suppliers from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device required by the Contract Documents, but not identified by Owner as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

7.09 *Permits and Utility Charges*

A. The Contract Documents allocate responsibility for obtaining and paying for specified permits, licenses, certificates of occupancy, and approvals of governmental authorities having jurisdiction over the Work. Each party shall assist the other, when necessary, in obtaining such permits, licenses, certificates, and approvals.

B. Design-Builder shall pay all charges of utility owners for temporary service to the Work. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work, and for capital costs related thereto.

7.10 *Taxes*

A. Design-Builder shall pay all sales, consumer, use, and other similar taxes required to be paid by Design-Builder in accordance with the Laws or Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

A. Design-Builder shall give all notices required by and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, Owner shall not be responsible for monitoring Design-Builder's compliance with any Laws or Regulations.

B. If Design-Builder performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Design-Builder shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work.

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C. Changes in Laws or Regulations that occur after the date on which the Design-Builder committed to the Contract Price (whether by negotiation or making an offer or proposal) and affect the cost or time of performance shall be the subject of an equitable change in Contract Price or Contract Times.

7.12 *Record Documents*

A. Design-Builder shall maintain the Record Documents in good order, in a safe place at the Site. Design-Builder shall annotate the Record Documents to show all changes and clarifications made (whether in the field or otherwise) during performance of Construction. The Record Documents, as annotated, will be available to Owner for reference. Upon completion of the Construction, Design-Builder shall deliver the Record Documents, as annotated, to Owner.

B. After receipt and review of the Record Documents from Design-Builder upon completion of Construction, the Owner may comment on any possible inaccuracies. After Owner and Design-Builder collaboratively address any such comments, the Record Documents shall be deemed to be Record Drawings and Record Specifications.

C. The Record Drawings and Record Specifications are Contract Documents, and are binding upon Design-Builder with respect to its obligations to comply with the Contract Documents, including but not limited to correction period responsibilities and warranty obligations.

7.13 *Safety and Protection*

A. Design-Builder shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Construction Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Design-Builder shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. All persons on the Site or who may be affected by the Work;

2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation, or replacement in the course of Construction.

B. Design-Builder shall comply with applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Design-Builder shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Design-Builder shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

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D. Design-Builder shall inform Owner of the specific requirements of Design-Builder's safety program with which Owner and its employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.13.A.2 or 7.13.A.3 caused, directly or indirectly, in whole or in part, by Design-Builder, any Construction Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Design-Builder.

F. Design-Builder's duties and responsibilities for safety and for protection of the Construction shall continue until such time as all the Work is completed, Owner has issued a notice to Design-Builder in accordance with Paragraph 14.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion), and Design-Builder has left the Site.

G. Design-Builder's duties and responsibilities for safety and protection shall resume whenever Design-Builder or any Construction Subcontractor, Supplier, or other representative returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Safety Representative*

A. Design-Builder shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.15 *Hazard Communication Programs*

A. Design-Builder shall be responsible for coordinating any exchange of safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Design-Builder is obligated to act to prevent threatened damage, injury or loss. Design-Builder shall give Owner prompt written notice if Design-Builder believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If a change in the Contract Documents is required because of the action taken by Design-Builder in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.17 *Post-Construction Phase*

A. Design-Builder shall:

1. Provide assistance in connection with the start-up and testing of any equipment or system.

2. Assist Owner in training staff to operate and maintain the Work.

7.18 *Design-Builder's General Warranty and Guarantee*

A. Design-Builder warrants and guarantees to Owner that Design-Builder will perform and complete the Construction as required by the Contract Documents, and that all Construction

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will be in accordance with the Contract Documents, the Construction Drawings, and the Construction Specifications (as duly modified in accordance with the Contract), and will not be defective.

B. Design-Builder's warranty and guarantee hereunder excludes defects or damage caused by:

1. Abuse, modification or improper maintenance or operation by persons other than Design-Builder, Construction Subcontractors, or Suppliers or any other individual for whom Design-Builder is responsible; or

2. Normal wear and tear under normal usage.

C. None of the following will constitute an acceptance by Owner of Work that is not in accordance with the Contract Documents or a release of Design-Builder's obligation to perform the Work in accordance with the Contract Documents, unless expressly stated otherwise in writing:

1. Observations by Owner;

2. The making of any progress or final payment;

3. The issuance of a certificate of Substantial Completion;

4. Use or occupancy of the Work or any part thereof by Owner;

5. Any review and approval of a Submittal;

6. Any inspection, test, or approval by others; or

7. Any correction of defective Construction by Owner.

7.19 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Design-Builder shall indemnify and hold harmless Owner, Owner's Consultant, and their officers, directors, members, partners, employees, agents, consultants, and subcontractors, from losses, damages, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, damages, or judgment is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Design-Builder, a Project Design Professional, any Construction Subcontractor, any Supplier, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

B. In any and all claims or actions against Owner, Owner's Consultant, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Design-Builder, a Project Design Professional, any Construction Subcontractor, any Supplier, any individual or entity directly or indirectly employed or retained by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.19.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Design-Builder, a Project Design Professional, or any Construction Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

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C. The indemnification obligations of Design-Builder under Paragraph 7.19.A shall not extend to the liability of Owner's Consultant, other consultants or design professionals of Owner, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, designs, or specifications.

ARTICLE 8 – SUBMITTALS

8.01 *Design-Builder's Preparation of Submittals*

A. Design Submittals shall be prepared by Project Design Professionals, on behalf of Design-Builder.

B. The appropriate Project Design Professional shall review and approve each Submittal (including but not limited to all Design Submittals), other than those Submittals not involving technical or engineering matters, before Design-Builder's transmittal of such Submittal to Owner. Such review and approval shall account for the following, as appropriate:

1. That any items covered by such Submittal will, after installation or incorporation in the Construction, comply with the information and requirements in the Contract Documents and the Construction Drawings and Construction Specifications, as duly modified, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, Construction Drawings, and Construction Specifications, as duly modified.

2. That if the Submittal includes any proposed modification of the Contract Documents, Construction Drawings, or Construction Specifications, or any proposed variation from the requirements of such documents, such proposed modification or variation is acceptable based on the standards of the engineering profession (or other applicable design profession), and if implemented will be supported by signing or sealing by a licensed design professional, as necessary.

C. Before Design-Builder's transmittal of a Submittal to Owner, the Design-Builder shall, as applicable:

1. Review and coordinate the Submittal with other Submittals and with the requirements of the Work, the Contract Documents, the Construction Drawings, and the Construction Specifications, as duly modified;

2. Determine and verify all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal, and confirm that the Submittal is complete with respect to all related data included in the Submittal;

3. Determine and verify the suitability of proposed materials and equipment with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation; and

4. Determine and verify all information relative to Design-Builder's responsibilities for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

D. Design-Builder shall give Owner specific written notice of any proposed modification of the Contract Documents, Construction Drawings, or Construction Specifications, and any

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variations that a Submittal may have from the requirements of the Contract Documents, Construction Drawings, and Construction Specifications, as duly modified. This notice shall be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Submittal in drawing form, by a specific notation made on the drawing itself.

E. Each Submittal shall bear a stamp or specific written certification by Design-Builder that it has satisfied its obligations under the Contract Documents with respect to preparation of the Submittal, and that Design-Builder approves the Submittal.

F. All Submittals must be acceptable based on compliance with form and content requirements of the Contract Documents. Design-Builder shall submit Design Submittals for Owner's review and approval. Other Submittals shall not require express approval, except as indicated in the Supplementary Conditions or elsewhere in the Contract Documents.

8.02 *Owner's Review of Submittals*

A. Owner will review all Submittals, and may comment on any Submittal. Any response to a Submittal by Owner shall be in accordance with the schedule of required Submittals accepted by Owner as required by Paragraph 2.07, and the provisions of the Contract Documents.

B. For those Submittals requiring Owner's review and approval, Owner's response will be in writing and will indicate either that Owner approves the Submittal or rejects the Submittal. Owner may also include comments regarding the approved or rejected Submittal. For those Submittals that do not require approval, the Submittal shall be deemed acceptable to Owner unless Owner responds with a timely objection or adverse comment.

C. Unless a specific provision of the Contract Documents expressly provides otherwise, Owner's review of a Submittal will be to determine if the Submittal complies with and is consistent with the Contract Documents. If Owner concludes that a Submittal requiring approval complies with and is consistent with the Contract Documents, the Owner shall approve such Submittal.

D. Owner's approval, rejection, or acceptance of a Submittal will not extend to the means, methods, techniques, sequences, or procedures of Construction, or to safety precautions or programs incident thereto.

E. Owner's review, comments, approval, rejection, or acceptance of Submittals shall not relieve Design-Builder from responsibility for (1) performance of the Work in accordance with the Contract Documents, (2) the scheduling and progress of the Work, (3) the means, methods, sequences, techniques, and procedures of Construction, and safety precautions and programs incident thereto, or (4) any variation from the requirements of the Contract Documents, unless Design-Builder has in a separate written communication at the time of submission called Owner's attention to each such variation, and Owner has given written approval of each such variation; nor shall Owner's review, comments, approval, rejection, or acceptance of a Submittal impose any such responsibility on Owner.

F. Construction tasks and expenditures by Design-Builder prior to Owner's review and approval or acceptance of any Submittal will be at the sole risk of Design-Builder.

G. In reviewing, approving, rejecting, accepting, or commenting on any Design Submittal, Owner does not assume responsibility for the design, for any deficiencies in the Design Submittal or in the Design Professional Services by which they were prepared, or for constructability, cost, or schedule problems that may arise in connection with the Design Submittal.

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H. The parties acknowledge that Design-Builder's design responsibilities continue after commencement of Construction. During the course of Construction, the Design-Builder may propose modifications to the Construction Drawings and Construction Specifications. Owner shall approve such proposed modifications if (1) they comply with and are consistent with the Contract Documents, (2) Design-Builder has demonstrated that the modification is minor in character, or will not be detrimental to the quality and function of the Work, (3) the appropriate Project Design Professional has reviewed and approved the proposed modification with respect to any technical or engineering matters, and (4) Owner has not relied on the previously-approved Construction Drawings and Construction Specifications, such that the proposed modification would be detrimental to the Owner's interests. At its option, Owner may also approve more substantial or divergent proposed modifications, provided that the appropriate Project Design Professional has reviewed and approved the proposed modification with respect to any technical or engineering matters.

ARTICLE 9 – OTHER CONSTRUCTION

9.01 *Other Work*

A. In addition to and apart from the Work to be performed and furnished by Design-Builder under the Contract Documents, the Owner may perform other construction work at or adjacent to the Site during the course of the Project. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Design-Builder written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work at or adjacent to the Site, Owner shall provide such information to Design-Builder.

C. Design-Builder shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and to Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Design-Builder shall do all cutting, fitting, and patching of the Construction that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Design-Builder shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Design-Builder may cut or alter others' work with the written consent of Owner and the others whose work will be affected.

D. If the proper execution or results of any part of the Construction depends upon work performed by others under this Article 9, Design-Builder shall inspect such other work and promptly report to Owner in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of the Construction. Design-Builder's failure to so report will constitute an acceptance of such other work as fit and proper for integration with the Construction, except for latent defects and deficiencies in such other work.

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9.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Design-Builder prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

B. If the Supplementary Conditions do not identify the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors, Owner shall have sole authority and responsibility for such coordination.

9.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Construction or to the property of Design-Builder or the Construction Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Construction, through actions or inaction, then Design-Builder shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Design-Builder in the Contract Documents, and any provisions in Laws or Regulations concerning utility action or inaction, or related remedies. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Design-Builder assigning to Owner all Design-Builder's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Design-Builder's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times.

B. Design-Builder shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Design-Builder fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Design-Builder, and assign to such other contractor or utility owner the Owner's contractual rights against Design-Builder with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Design-Builder shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Design-Builder's failure to take reasonable and customary measures with respect to Owner's other

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work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Design-Builder.

D. If Design-Builder damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Design-Builder's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Design-Builder's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Design-Builder or Owner, then Design-Builder shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and its officers, directors, members, partners, employees, agents, consultants and subcontractors from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 10 – OWNER'S RESPONSIBILITIES

10.01 *General*

A. Owner shall do the following in a timely manner so as not to delay the services of Design-Builder:

1. If requested in writing by Design-Builder, furnish reasonable evidence satisfactory to Design-Builder that sufficient funds are available and committed for the entire cost of the Project. Unless such reasonable evidence is furnished, Design-Builder is not required to commence or continue any Work, or may, if such evidence is not presented within a reasonable time, stop Work upon 15 days' notice to the Owner;

2. Make payments to Design-Builder promptly when they are due, as provided in Paragraph 14.01 and 14.06;

3. Furnish the Site as set forth in Paragraph 5.01; arrange for safe access to and make all provisions for Design-Builder to enter upon public and private property as may reasonably be required for Design-Builder to perform Work under the Contract.

4. Furnish to Design-Builder, as required for performance of the Work, the following, all of which Design-Builder may use and rely upon in performing services under this Agreement:

a. Environmental assessment and impact statements;

b. Property, boundary, easement, right-of-way, and other special engineering surveys or data;

c. Property descriptions;

d. Zoning, deed, and other land use restrictions;

e. Utility and topographic mapping and surveys;

f. Explorations and tests of subsurface conditions at or adjacent to the Site; geotechnical reports and investigations; drawings of physical conditions relating to existing surface or subsurface structures at the Site; any information or data known to Owner concerning underground facilities at the Site; hydrographic surveys,

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laboratory tests and inspections of samples, materials, and equipment; with appropriate professional interpretation of such information or data;

g. Any other available information pertinent to the Project including reports and data relative to previous designs, or investigation at or adjacent to the Site;

h. Engineering surveys to establish reference points which in Owner's judgment are necessary to enable Design-Builder to proceed with the Work;

i. Assistance to Design-Builder in filing documents required to obtain necessary permits, licenses, and approvals of governmental authorities having jurisdiction over the Project; and

j. Permits, licenses, and approvals of government authorities that the Contract Documents expressly require Owner to obtain.

5. Provide information known to Owner relating to the presence of materials and substances at the Site that could create a Hazardous Environmental Condition.

B. If an obligation ascribed to Owner in Paragraph 10.01.A is expressly assigned to Design-Builder, in the description of the Work or elsewhere in the Contract Documents, then such express assignment to Design-Builder shall supersede the provision in Paragraph 10.01.A.

C. Recognizing and acknowledging that Design-Builder's services and expertise do not include the following services, Owner shall furnish or obtain, as required for the Project:

a. Accounting, bond and financial advisory (including, if applicable, "municipal advisor" services as described in Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) and the municipal advisor registration rules issued by the Securities and Exchange Commission), independent cost estimating, and insurance counseling services.

b. Legal services with regard to issues pertaining to the Project as Owner requires, or Design-Builder reasonably requests.

c. Such auditing services as Owner requires to review cost submittals or ascertain how or for what purpose Design-Builder has used the money paid.

D. Examine all studies, reports, alternate solutions, sketches, drawings, specifications, proposals, Submittals (including Design Submittals), and other documents presented by Design-Builder (including obtaining advice of an attorney, insurance counselor, and other consultants as Owner deems appropriate with respect to such examination), and if a decision is required with respect to any such document, render such decision in writing pursuant to any specific schedule, or if no specific schedule pertains, within a reasonable time after receipt of the document.

10.02 *Insurance*

A. Owner's responsibilities with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

10.03 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Design-Builder's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Design-Builder

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to comply with Laws or Regulations applicable to the furnishing or performance of the Work. Owner will not be responsible for Design-Builder's failure to perform the Work in accordance with the Contract Documents.

10.04 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility with respect to undisclosed Hazardous Environmental Conditions uncovered or revealed at the Site is set forth in Paragraph 5.06.

10.05 *Owner's Site Representative*

A. Owner may furnish an Owner's Site Representative to observe the performance of Construction. The duties, responsibilities and limitations of authority of any such Owner's Site Representative and assistants will be as provided in the Supplementary Conditions.

10.06 *Owner's Consultants and Managers*

A. Owner's Consultant, if any, is identified in the Agreement.

B. Owner shall advise Design-Builder of the identity and scope of services of any other independent consultants or managers retained by Owner to perform or furnish services in regard to the Project, including, but not limited to, cost estimating, project peer review, value engineering, constructability review, program management, project management, or contract administration.

C. Neither Owner's Consultant, Owner's Site Representative, nor any other consultant or manager retained by Owner, has any duties, responsibilities, or authorities with respect to Design-Builder, unless expressly provided in this Contract. Owner's Consultant and such other consultants and managers shall not supervise, direct, or have control or authority over, nor be responsible for, Design-Builder's means, methods, techniques, sequences, or procedures of construction or the safety precautions and programs incident thereto, or for any failure of Design-Builder to comply with Laws or Regulations applicable to the furnishing or performance of the Work; and will not be responsible for Design-Builder's failure to perform the Work in accordance with the Contract Documents.

10.07 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Design-Builder's safety programs of which Owner has been informed pursuant to Paragraph 7.13.D.

B. Owner shall inform Design-Builder of any specific requirements of safety or security programs that are applicable to Design-Builder while at the Site.

10.08 *Permits and Approvals*

A. Owner shall obtain reviews, approvals, certificates, and permits from governmental authorities having jurisdiction over the Project as indicated in the Contract Documents.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order or a Work Change Directive.

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1. *Change Orders:* If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

2. *Work Change Directives*: The Work modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order. When a Work Change Directive is issued, the parties will promptly meet to attempt to negotiate the Work Change Directive's effect, if any, on the Contract Times and Contract Price. The effect, if any, on Contract Times and Contract Price, together with the Work Change Directive's addition, deletion, or revision to the Work, will be set forth in a subsequently issued Change Order.

B. Either Owner or Design-Builder may propose or request a Change Order. With respect to certain events, this Contract may indicate specific times in which such requests or proposals must be submitted to the other party. With respect to all other events, the request or proposal shall be submitted to the other party within 30 days of the event giving rise to the request or proposal.

11.02 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, and notwithstanding any other provision of the Contract, Owner may, at any time or from time to time, order or authorize additions, deletions, or revisions in the Work within the general scope of the Contract. Such changes may be accomplished by a Change Order, if Owner and Design-Builder have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Design-Builder shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Design-Builder to undertake work that Design-Builder reasonably concludes cannot be performed in a manner consistent with Design-Builder's safety or professional obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Design-Builder shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any Work performed that is not required by the Contract Documents, as duly amended, except in the case of an emergency as provided in Paragraph 7.16, or in the case of uncovering Construction as provided in Paragraph 13.03.A.3.

11.04 *Changes Involving the Design*

A. To the extent a change, whether proposed by Design-Builder or Owner, ordered by Owner, or set forth in a proposed Change Order or in a Work Change Directive, involves the design (as set forth in the Construction Drawings, Construction Specifications, or otherwise) or other engineering or technical matters, such changes must be reviewed and approved by the applicable Project Design Professional. The review and approval may occur at the time the change occurs, or as part of Design-Builder's provision of Professional Design Services in response to the change.

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11.05 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim regarding an adjustment in the Contract Price shall be presented by written notice to the other party in accordance with Paragraph 16.01.

B. If the Contract Price is based on Cost of the Work, then the provisions in the Agreement regarding Cost of the Work and changes in the Design-Builder's fee, Contract Price, Guaranteed Maximum Price, and Guaranteed Maximum Fee, apply.

C. The value of any Work covered by a Change Order or of any adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 12.02); or

2. Where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.05.D); or

3. Where the Work involved is not covered by unit prices contained in the Contract Documents, and agreement to a lump sum is not reached under Paragraph 11.05.C.2, then on the basis of the Cost of the Work for price adjustments (determined as provided in the Cost of the Work provisions in the Agreement, if applicable, or in Paragraph 12.01), plus a Design-Builder's Fee for overhead and profit (determined as provided in Paragraph 11.05.D).

D. *Design-Builder's Fee:* The Design-Builder's fee for overhead and profit on Change Orders shall be determined as follows:

1. A mutually acceptable fixed fee; or

2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. For costs incurred under Paragraphs 12.01.B.1.a. and 12.01.B.2, the Design-Builder's fee shall be 15 percent;

b. For costs incurred under Paragraph 12.01.B.3, 12.01.B.4, 12.01.B.5, and 12.01.B.6, the Design-Builder's fee shall be 5 percent;

c. With respect to Construction Subcontracts, where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of this Contract is that the Design-Builder's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraph 12.01 by the subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Design-Builder itself, and to any Construction Subcontractors of a tier higher than that of the Construction Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Construction Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Construction Subcontractor that actually performs the Work;

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d. With respect to Design Agreements, the Engineer or other invoicing Project Design Professional under a Design Agreement may add a fee of 5 percent to an invoice from a lower tier design entity , and Design-Builder may add a fee of 5 percent to an invoice from Engineer or other invoicing Project Design Professional; Owner shall not be responsible for any other mark-up at any tier (other than those incorporated in a factor, multiplier, hourly rate, or stipulated sum from the entity performing the subject Design Professional Services);

e. No fee will be payable on the basis of costs itemized in Paragraph 12.01.B.7 or 12.01.C;

f. The amount of credit to be allowed by Design-Builder to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Design-Builder's fee by an amount equal to 5 percent of such net decrease; and

g. When both additions and credits are involved in any one change, the adjustment in Design-Builder's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.05.D.2.a through 11.05.D.2.e., inclusive.

11.06 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim regarding an adjustment of the Contract Times shall be presented by written notice to the other party pursuant to Paragraph 16.01.

B. Design-Builder's entitlement to an adjustment of the Contract Times under this Contract is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times.

11.07 *Execution of Change Orders*

A. Owner and Design-Builder shall execute appropriate Change Orders covering:

1. Changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in Contract Price resulting from an Owner set-off, unless Design-Builder has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's correction of defective Work under Paragraph 13.05 or Owner's acceptance of defective Work under Paragraph 13.07, or (c) agreed to by the parties (all subject to the need for review and approval by the applicable Project Design Professional pursuant to Paragraph 11.04); and

4. Changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Article 16.

B. If Owner or Design-Builder refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

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11.08 *Notice to Sureties*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be Design-Builder's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – COST OF THE WORK ADJUSTMENTS; UNIT PRICE WORK

12.01 *Cost of the Work*

A. *Costs of the Work Adjustment:* When the price of Work covered by a Change Order or an adjustment in Contract Price is to be determined on the basis of Cost of the Work, the Cost of the Work adjustment means the sum of all costs necessarily incurred and paid by Design-Builder in the proper performance of the specific portion of the Work. The costs to be reimbursed to Design-Builder will be only those additional or incremental costs required because of the change of the Work or because of the event giving rise to the adjustment. If the Agreement contains Cost of the Work provisions, such provisions shall govern in determining the Cost of the Work for Change Order or adjustment purposes. If the Agreement does not contain Cost of the Work provisions, then the provisions in Paragraph 12.01 shall apply.

B. *Costs Included:* The Cost of the Work adjustment does not include any of the costs itemized in Paragraph 12.01.C, and shall include only the following items with respect to the subject Work:

1. Payroll costs for employees in the direct employ of Design-Builder in the performance of the subject Work, under schedules of job classifications agreed upon by Owner and Design-Builder in advance of such performance.

    a. Such employees shall include without limitation superintendents, foremen, and other personnel employed full-time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the subject Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation, and holiday pay applicable thereto. The expenses of performing the subject Work outside the hours or days permitted by this Contract shall be included in the above to the extent such performance of Work is authorized by Owner.

    b. Such employees shall also include engineers, engineering technicians, architects, and others providing Design Professional Services as employees of Design-Builder. For purposes of this Paragraph 12.01.B.1.b, Design-Builder shall be entitled to payment for such employees an amount equal to salary costs times a factor, as designated in the Agreement, for services in the performance of the subject Work.

2. Cost of all materials and equipment furnished and incorporated in the subject Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Design-Builder unless Owner deposits funds with Design-Builder with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and

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returns from sale of surplus materials and equipment shall accrue to Owner, and Design-Builder shall make provisions so that they may be obtained.

3. Cost of permits obtained by Design-Builder.

4. Payments made by Design-Builder to Construction Subcontractors for subject Work performed or furnished by such Construction Subcontractors. If any subcontract provides that the Construction Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Construction Subcontractor's Cost of the Work and fee shall be determined in the same manner as Design-Builder's Cost of the Work and fee.

5. Payments made by Design-Builder for Design Professional Services provided or furnished with respect to the subject Work under a Design Agreement.

6. Costs of special consultants (not including Project Design Professionals), including but not limited to testing laboratories, attorneys, and accountants, retained for services specifically related to the subject Work.

7. Supplemental costs including the following items:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Design-Builder's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the Site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed that remain the property of Design-Builder.

    c. Rentals of all construction or engineering equipment and machinery, and their parts, whether rented from Design-Builder or from others in accordance with rental agreements approved by Owner, and the costs of transportation, loading, unloading, installation, dismantling and removal of such equipment, machinery, and parts. All such costs shall be in accordance with the terms of such rental agreements. The rental of any such equipment, machinery, or parts shall cease when its use is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the subject Work, and for which Design-Builder is liable, imposed by Laws or Regulations.

    e. Deposits lost for causes other than negligence of Design-Builder, any Construction Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

    f. Losses, damages, and related expenses caused by damage to the subject Work not compensated by insurance or otherwise, sustained by Design-Builder in connection with the furnishing and performance of the Work provided they have resulted from causes other than the negligence of Design-Builder, any Construction Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Design-Builder's fee.

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g. The cost of utilities, fuel, and sanitary facilities at the Site, as applicable to the subject Work.

h. Minor expenses such as long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. Cost of premiums for all Bonds and insurance Design-Builder is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Design-Builder's officers, executives, principals (of partnerships and sole proprietorships), general managers, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Design-Builder whether at the Site or in Design-Builder's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 12.01.B.1, all of which are to be considered administrative costs covered by the Design-Builder's fee.

2. Expenses of Design-Builder's principal and branch offices other than Design-Builder's office at the Site.

3. Any part of Design-Builder's capital expenses, including interest on Design-Builder's capital employed for the subject Work and charges against Design-Builder for delinquent payments.

4. Costs due to the negligence of Design-Builder, any Construction Subcontractor, Engineer or other Project Design Professionals, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind, and the costs of any item not specifically and expressly included in Paragraph 12.01.B.

D. *Design-Builder's Fee*: When the value of the Work covered by a Change Order is determined on the basis of Cost of the Work, Design-Builder's fee shall be determined as set forth in Paragraph 11.05.D.

E. *Documentation:* Whenever the cost of any Work is to be determined pursuant to Paragraph 12.01.B and 12.01.C, Design-Builder will establish and maintain cost records in accordance with generally accepted accounting practices and submit in a form acceptable to Owner an itemized cost breakdown together with supporting data.

12.02 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all of Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of

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determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Design-Builder will be made by Owner.

B. If Design-Builder's compensation is based on Cost of the Work, this Contract will not include compensation under unit prices unless expressly stated otherwise.

C. Each unit price will be deemed to include an amount considered by Design-Builder to be adequate to cover Design-Builder's overhead and profit for each separately identified item.

D. Design-Builder or Owner may seek an adjustment in the Contract Price if:

1. The quantity of any item of Unit Price Work performed by Design-Builder differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. Such an adjustment would not duplicate, and is coordinated with, any other related adjustments of Contract Price; and

3. Design-Builder has incurred additional expense, or less expense, as a result of the variation in quantity.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE CONSTRUCTION

13.01 *Access to Construction*

A. Owner, Owner's Consultant, Owner's Site Representative, and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Construction at reasonable times for their observation, inspecting, and testing. Design-Builder shall provide them proper and safe conditions for such access and advise them of Design-Builder's Site safety procedures and programs so that they may comply therewith as applicable.

13.02 *Tests, Inspections, and Approvals*

A. Design-Builder shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. By the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. By Laws and Regulations, unless the Contract Documents or Laws and Regulations expressly allocate responsibility for a specific inspection or test to Owner;

3. To attain Owner's acceptance of materials or equipment to be incorporated in the Construction;

4. By manufacturers of equipment furnished under the Contract Documents;

5. To meet the requirements of the Construction Drawings and Construction Specifications;

6. For testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Construction; and

7. For acceptance of materials, mix designs, or equipment submitted for approval prior to Design-Builder's purchase thereof for incorporation in the Construction.

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B. Owner shall be responsible for arranging, obtaining, and paying for all inspections and tests expressly required by the Contract Documents or Laws and Regulations to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Construction shall be governed by the provisions of Paragraph 13.03.

C. All inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Design-Builder.

D. If the Contract Documents require the Construction (or part thereof) to be approved by Owner or another designated individual or entity, then Design-Builder shall assume full responsibility for arranging and obtaining such approvals.

E. Design-Builder shall give Owner reasonable notice of the planned schedule for all required inspections, tests, and approvals.

F. Design-Builder shall give Owner timely notice of readiness of the Construction (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

G. Each party shall provide the other with copies of any certificates of inspection or approval obtained with respect to tests and inspections.

H. Both parties may rely on the results of inspections and tests, performed pursuant to this paragraph and the governing provisions of the Contract Documents, Laws and Regulations, and the Construction Drawings and Construction Specifications.

I. If any Construction (or the construction work of others) that is required to be inspected, tested, or approved is covered by Design-Builder without written concurrence of Owner, then Contractor shall, if requested by Owner, uncover such Construction for observation. Such uncovering shall be at Design-Builder's expense unless Design-Builder has given Owner timely notice of Design-Builder's intention to cover the same and Owner has not acted with reasonable promptness in response to such notice.

13.03 *Uncovering Construction*

A. If Owner considers it necessary or advisable that covered Construction be observed by Owner or inspected or tested by others, then Design-Builder, at Owner's request, shall uncover, expose or otherwise make available for observation, inspection, or testing, as Owner may require, that portion of the Construction in question, furnishing all necessary labor, material, and equipment.

1. If the Construction had been covered contrary to the written request of Owner or a requirement of the Contract Documents, then uncovering it for Owner's observation and re-covering it shall be at Design-Builder's expense, regardless of whether it is defective.

2. If it is found that the covered Construction is defective, Design-Builder shall pay all costs and damages caused by or resulting from such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement, re-covering, or reconstruction (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price.

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3. If the covered Construction is not found to be defective, Design-Builder shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, re-covering, and reconstruction, subject to the provisions of Paragraph 13.03.A.1.

13.04 *Defective Construction*

A. It is Design-Builder's obligation to assure that the Construction is not defective.

B. Owner shall give Design-Builder prompt written notice of all defective Construction of which Owner has actual knowledge. Owner may reject, accept, or correct defective Construction.

C. Promptly after receipt of written notice of defective Construction, unless Owner expressly indicates that it will accept the defective Construction, Design-Builder shall correct all such defective Construction, whether or not fabricated, installed, or completed; or, if Owner has rejected the defective Construction, remove it from the Project and replace it with Construction that is not defective.

D. When correcting defective Construction, Design-Builder shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Construction.

13.05 *Owner May Correct Defective Construction*

A. If Design-Builder fails within a reasonable time after written notice from Owner to correct defective Construction or to remove and replace rejected Construction, or if Design-Builder fails to perform the Construction in accordance with the Contract Documents, or if Design-Builder fails to comply with any other provision of the Contract Documents, Owner may, after 7 days' written notice to Design-Builder, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.05 Owner shall proceed expeditiously. In connection with such corrective and remedial action, Owner may exclude Design-Builder from all or part of the Site, take possession of all or part of the Construction, and suspend Design-Builder's services related thereto, and incorporate in the Construction all materials and equipment stored at the Site or for which Owner has paid Design-Builder but which are stored elsewhere. Design-Builder shall allow Owner, Owner's Consultant, Owner's Site Representative, and Owner's other representatives, agents, employees, and contractors, access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

13.06 *Costs*

A. Design-Builder shall bear all costs arising out of or relating to the correction, removal, or replacement of defective Construction, including but not limited to repair of adjacent Work or property; delay costs and impacts; fees and charges of engineers, architects, attorneys, and other professionals; and all court, arbitration, or other dispute resolution costs.

B. All costs, losses, and damages (included but not limited to fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others) incurred or sustained by Owner in exercising its rights and remedies arising from defective Construction under this Article will be charged against Design-Builder, by set-off against payment or otherwise.

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C. Design-Builder shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to defective Construction.

13.07 *Owner's Acceptance of Defective Construction*

A. If, instead of requiring correction or removal and replacement of defective Construction, Owner prefers to accept it, Owner may do so. If such acceptance is proposed prior to final payment, it shall be subject to confirmation by the applicable Project Design Professional that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety. Design-Builder shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Construction. If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents, and Owner shall be entitled to an appropriate decrease in the Contract Price reflecting the diminished value of the Construction so accepted.

13.08 *Owner May Stop Construction*

A. If Construction is defective, or Design-Builder fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform Construction in such a way that the completed Construction will conform to the Contract Documents, Owner may order Design-Builder to stop Construction or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop Construction will not give rise to any duty on the part of Owner to exercise this right for the benefit of Design-Builder or any other party.

ARTICLE 14 – PAYMENTS TO DESIGN-BUILDER; COMPLETION

14.01 *Progress Payments*

A. *Basis for Progress Payments:* The Schedule of Values established as provided in Paragraph 2.04 will serve as the basis for progress payments. Progress payments on account of Unit Price Work will be based on the number of units completed.

B. *Application for Progress Payment:* On or about the date established in the Agreement for submission of each application for progress payment (but not more often than once a month), Design-Builder shall submit to Owner for review an Application for Payment filled out and signed by Design-Builder covering the Work completed as of the date indicated on the Application and accompanied by supporting documentation as required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect Owner's interest therein, all of which will be satisfactory to Owner.

C. *Payment of Obligations:*

1. Beginning with the second Application for Payment, each Application shall include an affidavit of Design-Builder stating that all previous progress payments received on

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account of the Work have been applied on account to discharge Design-Builder's legitimate obligations associated with prior Applications for Payment.

2. If Design-Builder contends that it has withheld payment of underlying obligations for good cause, then Design-Builder shall inform Owner of the identity of the entity from which Design-Builder has withheld payment, the amount of the withholding, and the reason for the withholding.

D. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

E. *Review of Applications:*

1. Owner will, within 10 days of receipt of each Application for Payment, either indicate in writing its acceptance of the Application and state that the Application is being processed for payment, or return the Application to Design-Builder indicating in writing its reasons for refusing to accept the Application.

F. Not more than 10 days after accepting such Application the amount will become due and when due will be paid by Owner to Design-Builder.

1. If Owner should fail to pay Design-Builder at the time the payment of any amount becomes due, then Design-Builder may, at any time thereafter, upon serving written notice that he will stop the Work within 7 days after receipt of the notice by Owner, and after such 7-day period, stop the Work until payment of the amount owing has been received. Written notice shall be deemed to have been duly served if sent by certified mail to the last known business address of Owner.

2. Payments due but unpaid shall bear interest at the rate specified in the Agreement.

3. No Progress Payment nor any partial or entire use or occupancy of the Project by Owner shall constitute an acceptance of any Work not in accordance with the Contract Documents.

G. *Reduction in or Refusal to Make Payment:*

1. Owner may impose a set-off against the whole or any part of any such payment, or nullify any previous payment because of subsequently discovered evidence or the results of subsequent inspections or tests, to the extent that is reasonably necessary to protect Owner from loss because:

a. Claims have been made against Owner on account of Design-Builder's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Design-Builder's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from breach of warranty, workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Design-Builder has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Design-Builder has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Design-Builder is responsible;

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e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Construction is defective, requiring correction or replacement;

g. Owner has been required to correct defective Construction in accordance with Paragraph 13.05, or has accepted defective Construction pursuant to Paragraph 13.07;

h. The Contract Price has been reduced by Change Orders;

i. An event that would constitute a default by Design-Builder and therefore justify a termination for cause has occurred;

j. Liquidated damages, special damages, or performance damages have accrued under the Contract Documents as a result of Design-Builder's failure to achieve Milestones, Substantial Completion, final completion of the Work, or performance requirements, as applicable;

k. Liens have been filed in connection with the Work, except where Design-Builder has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such liens; or

l. There are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, Owner will give Design-Builder immediate written notice stating the reasons for such action and the specific amount of the reduction, and promptly pay Design-Builder any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Design-Builder the amount so withheld, or any adjustment thereto agreed to by Owner and Design-Builder, if Design-Builder remedies the reasons for such action. The reduction imposed shall be binding on Design-Builder unless it duly presents a written notice of Claim contesting the reduction.

14.02 *Design-Builder's Warranty of Title*

A. Design-Builder warrants and guarantees that title to all Construction, materials, and equipment covered by any Application for Payment, whether already incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.03 *Substantial Completion*

A. When Design-Builder considers the Work ready for its intended use Design-Builder shall notify Owner in writing that the Work is substantially complete (except for items specifically listed by Design-Builder as incomplete) and request that Owner issue a certificate of Substantial Completion. Promptly thereafter, Owner and Design-Builder shall make an inspection of the Work to determine the status of completion. If Owner does not consider the Work substantially complete, Owner will notify Design-Builder in writing giving the reasons therefor.

B. If Owner considers the Work substantially complete:

1. Owner and Design-Builder will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and

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Design-Builder agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

2. Owner will prepare and deliver to Design-Builder a certificate of Substantial Completion which shall fix the date of Substantial Completion. Owner shall attach to the certificate a punch list of items to be completed or corrected before final payment.

C. After Substantial Completion the Design-Builder shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Design-Builder may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

D. Owner shall have the right to exclude Design-Builder from the Site after the date of Substantial Completion subject to allowing Design-Builder reasonable access to remove its property and complete or correct items on the punch list.

14.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Construction which (1) has specifically been identified in the Contract Documents, or (2) Owner and Design-Builder agree constitute a separately functioning and usable part of the Construction that can be used by Owner for its intended purpose without significant interference with Design-Builder's performance of the remainder of the Construction, subject to the following:

1. Owner at any time may request Design-Builder in writing to permit Owner to use or occupy any such part of the Construction that Owner believes to be ready for its intended use and substantially complete. If Design-Builder agrees that such part of the Work is substantially complete, Design-Builder and Owner will follow the procedures of Paragraph 14.03 for that part of the Construction.

2. Design-Builder at any time may notify Owner in writing that Design-Builder considers any such part of the Work ready for its intended use and substantially complete and request Owner to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner and Design-Builder shall make an inspection of that part of the Work to determine its status of completion. If Owner does not consider that part of the Work to be substantially complete, Owner will notify Design-Builder in writing giving the reasons therefor. If Owner considers that part of the Work to be substantially complete, the provisions of Paragraph 14.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy of part of the Construction will be accomplished prior to compliance with the requirements of Paragraph 6.05 regarding property insurance.

14.05 *Final Inspection*

A. Upon written notice from Design-Builder that the entire Work or an agreed portion thereof is complete, Owner will make a final inspection with Design-Builder and will notify Design-Builder in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Design-Builder shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

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14.06 *Final Payment*

A. *Application for Payment:*

1. After Design-Builder has completed all such corrections to the satisfaction of Owner and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance, certificates of inspection, and Record Documents, Design-Builder may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (unless previously delivered) by:

   a. All documentation called for in the Contract Documents;

   b. Consent of the surety, if any, to final payment;

   c. Satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment;

   d. A list of all disputes that Design-Builder believes are unsettled; and

   e. Complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of such releases or waivers of Liens specified in Paragraph 14.06.A.2, and as approved by Owner, Design-Builder may furnish receipts or releases in full and an affidavit of Design-Builder that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed, and (b) all payrolls, material and equipment bills and other indebtedness connected with the Work for which Owner might in any way be responsible, or which in any way might result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Project Design Professional, Construction Subcontractor, or Supplier fails to furnish such a release or receipt in full, Design-Builder may furnish a Bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Final Payment and Acceptance:* If Owner is satisfied that the Work has been completed and Design-Builder's other obligations under the Contract Documents have been fulfilled, Owner will, within 10 days after receipt of the final Application for Payment, give written notice to Design-Builder that the Work is acceptable. Otherwise, Owner will return the Application to Design-Builder, indicating in writing the reasons for refusing to process final payment, in which case Design-Builder shall make the necessary corrections and resubmit the Application.

C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment.

D. *Payment Becomes Due*: The amount will become due and will be paid by Owner to Design-Builder 30 days after the presentation to Owner of the acceptable Application and accompanying documentation, in appropriate form and substance and with Owner's notice of acceptability.

14.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Design-Builder. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.05, from Design-

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Builder's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from unresolved disputes or Claims presented by Owner, or from Design-Builder's continuing obligations under the Contract.

B. The acceptance of final payment by Design-Builder will constitute a waiver by Design-Builder of all claims and rights against Owner other than those pending matters that have been duly submitted to dispute resolution under the provisions of Article 16.

14.08 *Correction Period*

A. If within one year after the date of Substantial Completion of the entire Work or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Construction is found to be defective, Design-Builder shall promptly, without cost to Owner and in accordance with Owner's written instructions, (1) correct such defective Construction, or, if it has been rejected by Owner, remove it from the Site and replace it with Construction that is not defective, and (2) satisfactorily correct or remove and replace any damage to other Construction or the work of others resulting therefrom. If Design-Builder does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Construction corrected or the rejected Construction removed and replaced, and all costs, losses, and damages caused by or resulting from such removal and replacement (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others) will be paid by Design-Builder.

B. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Conceptual Documents.

C. Where defective Construction (and damage to other Construction resulting therefrom) has been corrected, or removed or replaced, under this Paragraph 14.08, the correction period hereunder with respect to such Construction will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 days by notice in writing to Design-Builder, which will fix the date on which Work will be resumed. Design-Builder shall resume the Work on the date so fixed. Design-Builder shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events justifies termination for cause:

1. Design-Builder's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the progress schedule as duly adjusted).

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2. Design-Builder's disregard of Laws or Regulations of any public body having jurisdiction.

3. Design-Builder's violation in any substantial way of provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occurs, Owner may, after giving Design-Builder (and the surety, if any) 7 days' written notice, terminate the services of Design-Builder, take possession of any completed Design Submittals prepared by or for Design-Builder (subject to the limited license and indemnification provisions of Paragraph 3.04), exclude Design-Builder from the Site, take possession of the Work, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Design-Builder but which are stored elsewhere, and finish the Work as Owner may deem expedient. In such case Design-Builder shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all costs, losses and damages sustained by Owner arising out of or resulting from completing the Work (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) such excess will be paid to Design-Builder. If such costs, losses and damages exceed such unpaid balance, Design-Builder shall pay the difference to Owner. Such costs, losses and damages incurred by Owner will be incorporated in a Change Order. When exercising any rights or remedies under this paragraph Owner shall not be required to obtain the lowest price for the Work performed.

C. Notwithstanding Paragraph 15.02.B, Design-Builder's services will not be terminated if Design-Builder begins, within 7 days of receipt of notice of intent to terminate, to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

D. Where Design-Builder's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Design-Builder then existing or which may thereafter accrue. Any retention or payment of moneys due Design-Builder by Owner will not release Design-Builder from liability.

15.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Design-Builder, Owner may, without cause and without prejudice to any other right or remedy of Owner, elect to terminate the Contract. In such case, Design-Builder shall be paid (without duplication of any items) for:

1. Completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. Expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. Amounts paid in settlement of terminated contracts with Project Design Professionals, Construction Subcontractors, Suppliers and others (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs incurred in connection with such terminated contracts); and

4. Reasonable expenses directly attributable to termination.

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B. Design-Builder shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Design-Builder May Stop Work or Terminate*

A. If, through no act or fault of Design-Builder, the Work is suspended for a period of more than 90 days by Owner or under an order of court or other public authority, Owner fails to act on any Application for Payment within 30 days after it is submitted, or Owner fails for 30 days to pay Design-Builder any sum finally determined to be due, then Design-Builder may, upon 7 days' written notice to Owner, and provided Owner does not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.A. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Owner has failed for 30 days to pay Design-Builder any sum finally determined to be due, Design-Builder may upon 7 days' written notice to Owner stop the Work until payment is made of all such amounts due Design-Builder, including interest thereon. The provisions of this paragraph are not intended to preclude Design-Builder from obtaining an increase in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Design-Builder's stopping Work as permitted by this paragraph.

ARTICLE 16 – DISPUTES

16.01 *Methods and Procedures*

A. *Notice of Claim:* If Owner and Design-Builder are not in agreement regarding a proposed or requested Change Order, other proposed adjustment of Contract Price or Contract Times, a Work Change Directive issued by Owner, or any other relief proposed or requested under the Contract, then either party may provide written notice of a Claim to the other party. Such notice of Claim shall be given within 90 days of: the proposal or request for a Change Order; such other proposed adjustment of Contract Price or Contract Times; the issuance of the Work Change Directive; or the proposal or request for other relief under the Contract. The notice of Claim shall be given within the 90 days regardless of whether the other party has responded to such proposal, request, or issuance, and regardless of whether discussions or negotiations are in progress; provided, however, that the parties may extend the time to give such notice of Claim by mutual written agreement. The notice of Claim shall include a statement of position, specification of the remedy sought, and supporting documentation.

B. *Response:* Within 30 days of the date of notice of Claim, the receiving party shall respond with a written statement of position and any supporting documentation.

C. *Direct Negotiations:* Owner and Design-Builder agree to directly negotiate all Claims between them in good faith for a period of 60 days from the date of notice of Claim.

D. *Mediation:* If direct negotiations are unsuccessful in resolving a Claim, then Owner and Design-Builder shall submit the unsettled Claim to mediation by a mutually agreeable mediator or mediation service. Owner and Design-Builder agree to participate in the mediation process in good faith. The process shall be conducted on a confidential basis, and shall be completed within 120 days.

1. The fees and expenses, including filing fees, of the mediator and any mediation service shall be shared equally by Owner and Design-Builder.

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2. The mediation shall be held in the locality where the Project is located, unless another location is mutually agreed upon by the parties.

3. A settlement (if any) resulting from such mediation will be specifically enforceable under the prevailing law, by any court having jurisdiction.

4. Participation in the mediation process in good faith is a condition precedent to commencing final or binding dispute resolution.

E. If mediation is unsuccessful in resolving a Claim, then within 120 days of the completion of the mediation (1) the parties may mutually agree to a binding dispute resolution process of their choice, or (2) the claimant may give notice to the other that the claimant will seek to have the dispute resolved by a binding dispute resolution method established in this Contract, or if no such method has been established, by a court of competent jurisdiction. Failure by claimant to give such notice in a timely manner shall result in a waiver of the Claim.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice to the other party to this Contract, it will be deemed to have been validly given if delivered to the Authorized Representative of the other party:

1. In person, by a commercial courier service or otherwise; or

2. By registered or certified mail, postage prepaid; or

3. By e-mail, with the words "Formal Notice" or similar in the e-mail's subject line.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. Unless expressly stated otherwise in this Contract, the duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, or waiver of, any rights and remedies available to any or all of them which are otherwise imposed or available by:

1. Laws or Regulations; or

2. Any special warranty or guarantee; or

3. Other provisions of the Contract.

B. The provisions of Paragraph 17.03.A will be as effective as if repeated specifically in the Contract in connection with each particular duty, obligation, right and remedy to which they apply.

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17.04 *Limitation of Damages*

A. With respect to this Contract and any and all Claims and other matters at issue, Owner shall not be liable to Design-Builder for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Design-Builder on or in connection with any other project or anticipated project.

17.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

17.06 *Survival of Obligations*

A. All representations, indemnifications, warranties and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Contract.

17.07 *Controlling Law*

A. The Contract Documents will be construed in accordance with the law of the place of the Project.

17.08 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. Requirements for the submittal of information that will enable determination of whether the Contractor's proposed materials, equipment or methods of work are in general conformance to the design concept and in compliance with the Contract Documents.

B. Furnish drawings, specifications, descriptive data, certificates, samples, test results, methods, schedules, manufacturer's installation instructions and other information as indicated.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 99 00 – Reference Forms

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the materials and equipment incorporated into the Work, or the methods of performing the Work shall be as described in the accepted submittals.

B. Verify that all features of all products conform to the specified requirements. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment that are being submitted for review. Extraneous materials shall be crossed out or otherwise obliterated.

C. Coordinate submittals among subcontractors and suppliers. Ensure that there is no conflict with other submittals and notify the Engineer in each case where this submittal may affect the work of another contractor or the Owner, including those submittals complying with unit responsibility requirements specified in applicable technical sections.

D. Coordinate submittals with the Work so that work will not be delayed. Coordinate and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another. No extension of time will be allowed because of failure to properly schedule submittals.

E. Do not proceed with work related to a submittal until the submittal process is complete and the submittal has received a response "No Exceptions Taken" or "Make Corrections Noted."

F. Certify on each submittal document that the Contractor has reviewed the submittal, verified field conditions, and complied with the contract documents.

1. Include a copy of the specification section with addendum updates, all referenced and applicable sections, and each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.

a. Use check marks (✓) to denote full compliance with a paragraph as a whole.

b. If deviations from the specifications are indicated and therefore requested by the Contractor, underline each deviation, and denote by a number in the margin to the right of the identified paragraph.

c. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications.

d. Include a detailed, written justification for each deviation.

2. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

1.04 REVIEW COSTS

A. The Owner's cost for review of submittals for the same proposed materials, equipment or work will be apportioned as follows:

1. The cost of review of the initial submittal and the first revised submittal will be borne by the Owner.

2. The cost to review all additional revised submittals after the first revised submittal will be charged to the Contractor. The cost of review shall include, without limitation, administrative, design and engineering activities directly related to review of submittals.

1.05 SUBMITTAL INDEX

A. Within 30 days of the Notice to proceed, submit a list, by specification section, of all submittals to be submitted.

B. Update and resubmit the submittal index on a monthly basis where additional submittals are identified, or as necessary

1.06 CATEGORIES OF SUBMITTALS

A. General

1. Submittals fall into two general categories;

a. Submittals for review and comment require action by the Engineer.

b. Submittals that are primarily for information only do not require Engineer's approval.

B. Submittals for Review and Comment

1. Transmit submittals for review and comment to the Engineer. The Engineer will review the submittal for compliance with the Contract requirements and will provide written comments regarding acceptability.

C. Submittals for Information Only

1. Where specified, furnish submittals to the Engineer for information only. The Engineer may, at the Engineer's option, review, and comment on any product data.

2. Incomplete or inadequate product data will be returned to the Contractor for resubmittal.

1.07 TRANSMITTAL PROCEDURES

A. General

1. Transmit submittals regarding material and equipment under cover of a Shop Drawing/Transmittal Form See Section 01 99 00.

2. Use a separate form for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required.

3. Identify submittal documents common to more than one piece of equipment with all the appropriate equipment numbers.

4. Make submittals for various items with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.

5. Assign a unique sequential number on the transmittal form accompanying each item submitted.

a. Use the following format for original submittal numbers: "XXX"; where "XXX" is the sequential number assigned by the Contractor.

b. Use the following format for resubmittals: "XXX-Y"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals, i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. Submittal 25B, for example, is the second resubmittal of submittal 25.

B. Electronic Submittals

1. Electronic submittals are preferred except as otherwise indicated.

2. Prepare electronic submittals and Shop Drawings in electronic (*.pdf) format including half-sized and full-sized drawings, catalog information and other required submittal information.

3. Break down submittals that are larger than 10 megabytes into smaller sections, using logical division points to create sections.

4. Electronically bookmark electronic submittals greater than 30 pages in length by major submittal section to facilitate ease of navigation.

C. Paper copy submittals are not an acceptable alternative to electronic submittals except for samples.

D. Deviation from Contract

1. If the Contractor proposes to provide material, equipment, or method of work that deviates from the project manual, so indicate under "Proposed Deviations" on the transmittal form accompanying the submittal copies.

E. Submittal Completeness

1. Submittals that do not have all the information required to be submitted, including deviations, are not acceptable and will be returned without review.

1.08 SUBMITTAL CONTENT

A. Prepare submittals in compliance with individual Specification Sections and as indicated herein.

B. Shop Drawings:

1. Develop project-specific, scaled drawings to fully identify materials and products that will be provided and their relationship to other products that will be furnished and installed.

2. Do not utilize reproductions of the Contract Documents as the basis for the submittal.

3. Identify products, assemblies, equipment, and systems.

4. Provide equipment identification numbers or tag numbers, wiring diagrams, and setting diagrams.

5. Identify critical dimensions.

C. Product Data:

1. Provide information necessary to demonstrate conformance with the specified requirements. Include performance curves, specifications, and wiring diagrams.

2. Product data may consist of manufacturer's standard catalog information and data sheets, marked to indicate the specific products that will be provided.

3. Provide supplemental information as necessary to fully demonstrate how products will be modified from the manufacture's standard products to meet the specification requirements.

D. Manufacturer's Instructions: Written or published information that establishes the manufacturer's recommendations, guidelines and procedures for handling and installation of products, equipment, and assemblies.

E. Samples: Mount, display or package samples in a manner that will facilitate review and establish workmanship and quality of materials.

1.09 SUBMITTAL REQUIREMENTS

A. When the Contract Documents require a submittal, submit the specified information as follows:

1. Submittals for Review and Comment:

a. Electronic Submittal: Submit one electronic (*.pdf) submittal.

2. Submittals for Information Only:

a. Electronic Submittal: Submit one electronic (*.pdf) submittal.

1.10 REVIEW PROCEDURE

A. General

1. The Engineer will review submittals within the processing time identified in paragraph “Processing Time” and return:

a. Electronic Submittal – a signed submittal response document, in (*.pdf) format.

b. Paper Copy Submittal – Two marked up copies of the submitted copies. The reproducible original will be retained by the Engineer.

B. Submittals for Review and Comment

1. The returned submittal will indicate one of the following actions:

a. "NO EXCEPTIONS TAKEN" – The material, equipment or work method complies with the project manual.

b. "MAKE CORRECTIONS NOTED" – Limited corrections are required.

1) Provide a corrected copy where:

a) The information is to be included in the O&M data.

b) If requested by the Engineer.

c. "AMEND AND RESUBMIT" – The submittal is insufficient or contains incorrect data.

d. "REJECTED – SEE REMARKS" – The material, equipment, or work method does not comply with the project manual. Submittals with deviations that have not been identified clearly may be rejected.

2. For submittals marked "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED.

a. The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with any noted corrections.

3. For submittals marked "AMEND AND RESUBMIT" or "REJECTED – SEE REMARKS"

a. Contractor shall provide a typed letter responding to each of the Engineer’s review comments with each resubmittal.

b. Except at its own risk, the Contractor shall not undertake the work covered by such submittals until a new submittal is submitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

C. Submittals for Information Only

1. The returned submittal will indicate ACCEPTED FOR RECORD” if the submittal is complete and adequate.

2. Engineer may return comments on information submittals to identify concerns with what was submitted, in such case, Contractor shall address concerns in writing and return a revised submittal.

1.11 PROCESSING TIME

A. Prepare submittals and transmit to Engineer for review in sufficient time to allow Engineer's review; manufacture, fabrication or assembly of materials and systems; and shipping of material to the site in time for installation in accordance with the Contractor's schedule.

B. Engineer's time for review will begin upon receipt of a complete and comprehensive submittal containing all required information.

C. Engineer will review submitted information and transmit a response to Contractor within 21 days after receipt, subject to the following:

1. In some instances, review times for specific submittals may be modified by the individual specification Section.

2. Resubmittals will be subject to the same review time.

D. No adjustment of Contract Time or Contract Price will be allowed due to delays in the progress of the Work that are caused by rejected submittals and subsequent resubmittals.

1.12 EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS

A. The purpose of submittals is to demonstrate how Contractor intends to conform to the Contract Documents and design concepts. Engineer is entitled to rely upon the accuracy and completeness of designs, calculations, or certifications made by licensed professionals whether or not a stamp or seal is required by the Contract Documents.

B. The review procedure is based on the Contractor's guarantee that all features and characteristics not requiring submittals conform to the contract documents.

C. Review of contract drawings, methods of work, or information regarding materials or equipment the Contractor proposes to provide, does not relieve the Contractor of its responsibility for

1. Fulfilling the requirements of the Contract,

2. Proper operation of the equipment,

3. Correction of defective work

D. Reviews shall not be regarded as an assumption of risk or liability by the Engineer or the Owner.

E. A mark of "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED" means that the Owner has no objection to the Contractor, upon its own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.

F. The Engineer's review of shop drawings, samples, or test procedures will be only for conformance with design concepts and for compliance with information given in Contract Documents. The Engineer's review does not extend to:

1. Accuracy of dimensions, quantities, or performance of equipment and systems designed by Contractor.

2. Contractor's means, methods, techniques, sequences, or procedures except when specified, indicated on the Drawings, or required by Contract Documents.

3. Safety precautions or programs related to safety which shall remain the sole responsibility of the Contractor.

G. Review of a separate item does not indicate approval of the assembly in which the item functions.

1.13 SUBSTITUTIONS OR "OR EQUAL" ITEMS

A. Named or Sole Source Times

1. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required.

2. Unless the name designated a "sole source" and/or is followed by words indicating that no substitution is permitted, materials, or equipment of other Suppliers may be accepted by Engineer. Follow the procedures in the General Conditions.

B. Modification due to Substitutions

1. All costs for redesign required by the implementation of the proposed substitute shall be borne by the Contractor.

2. All costs associated with incorporating a substitution into the project shall be borne by the Contractor.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

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SECTION 02 41 00

DEMOLITION, SALVAGE AND ABANDONMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Demolition, salvage, and abandonment of existing facilities.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 31 00 00 – Earthwork

1.03 SUBMITTALS

A. Comply with Section 01 33 00.

B. Description of removal procedures for careful removal of materials and equipment and the protection of facilities which are to remain undisturbed.

C. Time schedule for demolition work. Show demolition in relation to new construction, including any temporary facilities.

1.04 EXISTING CONDITIONS

A. Prior to the submittal of Bids, Contractor shall visit the site and inspect all facilities to become familiar with existing conditions and utilities.

1.05 REGULATORY REQUIREMENTS

A. Dispose of debris offsite in accordance with the requirements of agencies having jurisdiction.

B. Comply with applicable air quality control regulations.

C. Obtain necessary permits for building demolition, transportation of debris to disposal site(s) and dust control.

D. Erect appropriate safety devices to protect the general public, Owner's operations personnel, and workers from the hazards of demolition activities. Install barriers, guard rails and fences, and provide appropriate warning signs.

1.06 BURNING

A. The use of burning at the project site for the disposal of refuse, debris, and waste materials will not be permitted.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. The Drawings identify the major equipment and facilities to be demolished, salvaged, or abandoned. Auxiliary utilities such as water, air, drainage, lubrication oil, electrical wiring, controls, and instrumentation are not necessarily shown. Remove auxiliary utilities, as well as equipment and pipe supports and associated instrumentation devices pertaining to piping or equipment designated to be removed.

3.02 PROTECTION OF EXISTING FACILITIES

A. Before beginning any cutting, trenching, or demolition work, carefully survey the existing work and examine the Contract Documents to determine the extent of the Work.

B. Take precautions to prevent damage to facilities which are to remain in place or are to be salvaged, and be responsible for any damages to these facilities resulting from this work. Repair or replace damages to such work to return the facilities to its pre-existing condition at no additional cost to the Owner.

3.03 DEMOLITION

A. Demolish structures and equipment in an orderly and safe manner.

B. Dispose of material not identified for salvage or re-installation at a new location.

C. Minimize dust by sprinkling with water.

D. Backfill excavations caused by demolition in accordance with Section 31 00 00.

3.04 SALVAGE

A. Carefully remove and salvage, for reuse by the Owner, items, if any, identified on the Drawings

B. Remove salvage items in their largest pieces that can be easily handled and stored by Owner's personnel. Remove these items from their existing location and deliver them to a location designated by the Owner.

C. Remove items to be salvaged in a workmanlike manner and take the necessary precautions to prevent damage to the materials and equipment.

3.05 BURIED PIPELINES

A. Where buried pipelines are shown to be removed on the Drawings, they may be abandoned in place if there is no conflict with proposed construction and they are not located under or within 10 feet of any proposed structure.

3.06 ASBESTOS CEMENT PIPE

A. Remove and dispose of asbestos cement pipe disturbed during the performance of the Work. Remove and dispose in accordance with all Federal, State, and local laws, regulations, requirements, and guidelines.

B. Notify all appropriate authorities prior to performing work related to removal and disposal of asbestos cement pipe.

C. Provide landfill disposal weight records to Engineer for use as the basis of unit price payment.

D. Where necessary to connect into existing City asbestos cement potable water lines, perform work in accordance with all Federal, State, and local laws, codes, requirements, and guidelines.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. Concrete, site debris, rubbish, and other materials resulting from demolition operations, as well as mechanical and electrical equipment designated to be demolished, shall be the property of the Contractor and shall be legally disposed of at the Contractor's expense.

3.08 CLEANING

A. During and upon completion of the demolition operations, promptly remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave work areas in a clean condition.

B. Do not sweep, grade, or flush surplus materials, rubbish, or debris into storm drains, channels, lakes, or streams.

END OF SECTION

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SECTION 05 50 01

ANCHOR BOLTS AND ANCHORING DEVICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Anchor bolts, concrete anchors, adhesive anchors, and other anchoring devices.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals

1.03 SUBMITTALS

A. Comply with Section 01 33 00.

B. Product Data: Manufacturer's data for nuts, bolts, concrete anchors, chemical anchors and other fasteners.

C. Catalog data and ICC reports for each type of anchor bolt.

1.04 QUALITY ASSURANCE

A. For applications that require special inspection in accordance with building codes, coordinate the progress of the Work with the required inspection activities.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Unless otherwise specified or indicated on the Drawings, materials of construction for anchoring devices shall conform to the following:

1. Anchor bolts and other anchoring devices, nuts and washers installed indoors: Type 304 stainless steel.

2. Anchor bolts and other anchoring devices, nuts and washers installed outdoors or in locations exposed to wastewater: Type 316 stainless steel.

a. Locations exposed to wastewater includes:

1) Below tops of walls of water-containing structures.

2) Underside of roof, slab or walkways of enclosed water-containing structures.

3) Dry side of walls on water-containing structures.

2.02 CAST-IN-PLACE ANCHOR BOLTS

A. Locations for use of cast-in-place anchor bolts:

1. In locations indicated on the Drawings.

2. To anchor engine-driven equipment and equipment with motors 3 horsepower and larger.

B. Cast-in-Place Anchor Bolts

1. Material: Stainless steel conforming to ASTM A320.

2. Minimum Length of Bolt: As indicated on the Drawings. When not indicated, provide bolt length such that the length of the embedded anchor is at least 10 bolt diameters.

3. Minimum length of 90-degree hook: 4 bolt diameters.

2.03 CONCRETE ANCHORS

A. Concrete Anchors: Drilled in place wedge-type anchors with threaded stud body, stainless steel expansion clip, nut and washer.

B. Materials: Type 304 or Type 316 stainless steel, depending upon installed location.

C. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC193.

D. Manufacturers: One of the following or equal:

1. Hilti Kwik Bolt 3.

2. ITW Redhead, Trubolt Wedge Anchor.

3. Dewalt Fasteners, Power-Stud SD4 or SD6.

4. Simpson Strong Tie, Strong-Bolt 2 Wedge Anchors.

2.04 STUDS

A. Material: Conforming to ASTM A108 with 50,000 pounds per square inch minimum yield strength, and 60,000 pounds per square inch minimum tensile strength.

B. Manufacturers: One of the following or equal:

1. Nelson Stud Welding Company, S3L Shear Connectors or H4L Concrete Anchors.

2. Stud Welding Products, Headed Concrete Anchors and Shear Connectors or Concrete Anchors.

2.05 ADHESIVE ANCHORS

A. Applications: Use for bonding threaded rods and concrete reinforcing bars to hardened concrete and grouted cement masonry. Do not use in overhead applications, in chlorine gas environments, or where anchor may be exposed to machine oil or diesel oil.

B. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC58.

C. Materials

1. Epoxy Adhesive: Two component, injectable epoxy adhesive.

2. Concrete Reinforcing Bars: Grade 60.

3. Threaded Rods: Type 304 stainless steel all-thread rod conforming to ASTM F593.

D. Manufacturers: One of the following or equal:

1. Hilti HVA Adhesive Anchor System.

2. ITW Redhead G6+ Adhesive Anchoring System.

3. Dewalt Fasteners PE1000+ Epoxy Anchoring System.

4. Simpson Strong Tie, SET-XP Epoxy Adhesive.

PART 3 - EXECUTION

3.01 GENERAL ANCHORING REQUIREMENTS

A. Use equipment shop drawings, anchorage layout drawings, and anchor bolt layout templates to accurately position anchor bolts.

B. Install anchor bolts, concrete anchors and other anchoring devices with at least 2 threads projecting beyond the nut, but no more than 1/2-inch projecting beyond the nut.

C. Prior to installing nuts, coat threads of stainless steel bolts with material to prevent galling of threads.

1. Manufacturers: One of the following or equal:

a. Never Seez Compound Corporation, Never-Seez.

b. Oil Research, Inc., WLR No. 111.

D. Tighten nuts on anchor bolts, concrete anchors and other anchoring devices to the "snug-tight" condition, defined as tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary wrench.

3.02 CAST-IN-PLACE ANCHOR BOLTS

A. Do not use expansion type concrete anchors or adhesive anchors as substitution for cast-in-place anchor bolts.

B. Accurately place anchor bolts to be embedded in concrete within the formwork and perpendicular to surface from which they will project. Secure in correct position while concrete is placed.

C. Do not allow anchor bolts to touch reinforcing steel. Where anchor bolts are within 1/4 inch of reinforcing steel, isolate with a minimum of 4 wraps of 10 mil polyvinyl chloride tape in area adjacent to reinforcing steel.

D. In anchoring machinery bases subject to heavy vibration, use 2 nuts, with 1 serving as a locknut.

E. Where bolts are indicated on the Drawings for future use, first coat thoroughly with non-oxidizing wax, then turn nuts down full depth of thread and neatly wrap exposed thread with waterproof polyvinyl tape.

F. Where indicated on the Drawings, set anchor bolts in metal sleeves having inside diameter approximately 2 inches greater than the bolt diameter and a minimum of 10 bolt diameters deep. Fill sleeves with grout when equipment is grouted in place.

3.03 CONCRETE ANCHORS AND ADHESIVE ANCHORS

A. Cast-in-place anchor bolts may be used in place of concrete anchors and adhesive anchors at Contractor’s option.

B. Installation

1. Drill holes using concrete drill bits and impact type drill motors. Hole diameter shall be in accordance with the manufacturer's recommendations.

2. Clean drilled hole using compressed air to dislodge and remove drilling dust.

3. Accurately locate concrete anchors and set anchors with axis perpendicular to surfaces from which they will project.

4. Do not disturb adhesive anchors until cure time has elapsed.

5. Unless otherwise indicated on the Drawings or as required by structural calculations prepared by the equipment supplier, comply with minimum embedment lengths identified in the following table.

Minimum Embedment Lengths for Concrete and Adhesive Anchors

Diameter of Anchor or Bar, inches	Embedment Length for Concrete Anchors, inches	Embedment Length for Adhesive Anchors or Reinforcing Bars
1/4	1-3/4	As indicated on the Drawings
3/8	1-7/8	
1/2	2-1/4	
5/8	2-3/4	
3/4	3-1/4	
(1) Provide longer embedment where otherwise indicated		

END OF SECTION

SECTION 05 52 00

HANDRAIL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Aluminum handrail.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section:

1. Section 01 33 00 – Submittals

1.03 PERFORMANCE REQUIREMENTS

A. Design railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Aluminum Handrails: The lesser of minimum yield strength divided by 1.65 or minimum ultimate tensile strength divided by 1.95.

B. Structural Performance: Provide railings capable of withstanding the following loads and stresses:

1. Handrails:

a. Uniform load of 50 pounds per lineal foot applied in any direction.

b. Concentrated load of 200 pounds applied in any direction.

c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Top Rails of Guards:

a. Uniform load of 50 pounds per lineal foot applied horizontally and concurrently with 100 pound load applied vertically downward.

b. Concentrated load of 200 pounds applied in any direction.

c. Uniform and concentrated loads need not be assumed to act concurrently.

C. Thermal Movement: Provide exterior railings that allow for thermal movements resulting from a change in surface temperature of 120 degrees.

D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.04 SUBMITTALS

A. Comply with Section 01 33 00.

B. Product Data: Manufacturer's standard catalog data for mechanically connected railings.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

D. Calculations: Structural analyses signed and sealed by the qualified professional engineer, licensed in the State of Oregon, responsible for their preparation.

E. Samples for selection of surface color or texture.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E894 and ASTM E935.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing through one source from a single manufacturer.

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication. Indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: One of the following or equal:

1. Aluminum Pipe and Tube Railings:

a. AlumaGuard Corp.

b. CraneVeyor Corp.

c. Blum, Julius & Co., Inc.

d. Moultrie Manufacturing Company.

2.02 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.03 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

B. Extruded Bars and Tubing: ASTM B221, Alloy 6063-T5/T52.

C. Extruded Structural Pipe and Round Tubing: ASTM B429, Alloy 6063-T6.

1. Provide Standard Weight (Schedule 40) pipe, unless otherwise indicated.

D. Drawn Seamless Tubing: ASTM B210, Alloy 6063-T832.

E. Plate and Sheet: ASTM B209, Alloy 6061-T6.

F. Die and Hand Forgings: ASTM B247, Alloy 6061-T6.

G. Castings: ASTM B26/B26M, Alloy A356.0-T6.

2.04 FASTENERS

A. General: Provide the following:

1. Aluminum Railings: Type 316 stainless-steel fasteners.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Anchors: Provide chemical or expansion-type anchors, fabricated from Type 316 stainless steel with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E488 conducted by a qualified independent testing agency.

2.05 FABRICATION

A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with either welded or nonwelded connections, unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove flux immediately.

4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

K. Form changes in direction by bending or by inserting prefabricated elbow fittings.

L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

M. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

N. For removable railing posts, fabricate slip-fit sockets from stainless steel tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height. Provide socket covers designed and fabricated to resist being dislodged.

1. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

2.06 FINISHES, GENERAL

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Finishes

1. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.

3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.02 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to 1 side, and locate joint within 6 inches of post.

3.03 ANCHORING POSTS

A. For aluminum pipe railings, attach posts using fittings designed and engineered for this purpose.

B. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.04 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work.

END OF SECTION

SECTION 13 34 00

REINFORCED, CAST-IN-PLACE CONCRETE TANK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Design, engineering, calculations, drawings, fabrication, and construction of a new reinforced concrete tank, and includes designing, furnishing, constructing, testing, bonding, cleaning, and permitting.

B. Tank and foundation shall be reinforced concrete, cast-in-place construction with a roof as indicated and specified in this specification section and in the project drawings.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals

1.03 QUALITY ASSURANCE

A. Tank Design-Builder Qualifications

1. All work in connection with design and construction of the tank shall be performed by a competent and experienced Tank Design-Builder who has at least ten years' experience.

2. All work in connection with design, engineering, fabrication, and construction of the tank shall be performed by a competent and experienced Tank Design-Builder with a minimum of ten years' experience.

3. Must have previously constructed a minimum of ten (10) similar tanks of a similar size or larger within the last five years.

4. Hold a current Oregon state contracting license and supply with the bid proof of the license and a list of references of previously constructed tanks.

B. Design Responsibility

1. The Tank Design-Builder shall provide certification, signed by a Oregon Registered Structural Engineer, stating that all members, elements and connections of and to the tank are designed to withstand required loads and forces. Certification shall list the codes and specifications to which structural design conforms. Tank construction drawings and calculations, noted under Submittals of these specifications, shall bear the stamp of a Oregon Registered Structural Engineer.

C. The Tank Design-Builder shall use all new tank materials when manufacturing and constructing the reinforced concrete tank and any of its appurtenances.

D. Construction of the tank is to be by the Tank Design-Builder and must be fully responsible for the entire installation including tank construction, and the ultimate water tightness of the complete installation.

1.04 REFERENCES

A. The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and the listed standards, the requirements of this section shall prevail.

Standard	Title
AASHTO T210	Aggregate Durability Index
ACI 214	Evaluation of Strength Test Results of Concrete
ACI 301	Structural Concrete for Buildings
ACI 304	Measuring, Mixing, Transporting, and Placing Concrete
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 347R	Concrete Formwork
ASTM C31	Making and Curing Concrete Test Specimens in the Field
ASTM C33	Concrete Aggregates
ASTM C39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C42	Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C94	Ready-Mixed Concrete
ASTM C117	Materials Finer Than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C142	Clay Lumps and Friable Particles in Aggregates
ASTM C143	Slump of Portland Cement Concrete
ASTM C150	Portland Cement
ASTM C157	Length Change of Hardened Cement Mortar and Concrete
ASTM C172	Sampling Freshly Mixed Concrete
ASTM C231	Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Air-Entraining Admixtures for Concrete
ASTM C289	Potential Reactivity of Aggregates (Chemical Method)
ASTM C595	Blended Hydraulic Cements
ASTM C618	Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
CRD-C572	Corps of Engineers Specifications for Polyvinylchloride Waterstop
NSF/ANSI 61	Drinking Water System Components – Health Effects

1.05 SUBMITTALS

A. Comply with Section 01 33 00 and submit the following:

1. Complete detailed design and drawings of tank including roof, wall, foundation, concrete mix, reinforcement, anchoring, appurtenances, earthwork, erosion control, and all other required design within the construction limits on the Drawings. Detailed design shall include any other pertinent data concerning the construction of the tank.

2. Structural calculations of the tank, accessory items, tank foundation, and tank anchor bolts shall be prepared and signed by a Structural Engineer currently licensed in the State of Oregon. The name and address of the responsible engineer shall appear on the cover of the submitted calculations. The submittal shall include a description of structural design, loading conditions, seismic anchorage calculations and details, and codes used in establishing the allowable stresses and safety factors.

3. Horizontal and vertical loadings, erection and settlement tolerances.

4. Concrete submittals to be submitted in accordance with the Contract Documents.

5. Hydraulic testing report.

1.06 DESIGN CRITERIA

A. Tank Specifications

1. Refer to project drawings

2. Inside Diameter: 26.0 feet

3. Side Wall Height (top of foundation to top of roof): 25 feet

4. Max WSE: 23.5 feet

5. Design Capacity: 93,318 gallons at max WSE

1.07 WARRANTY

A. The Tank Design-Builder must include a warranty on tank materials and workmanship for a specified period. As a minimum, the warranty must provide assurance against defects in material, coatings and workmanship for a period of five (5) year after Notice of Acceptance has been issued or the tank is placed into service (whichever comes first.

PART 2 - PRODUCTS

2.01 TANK SUPPLIERS

A. Named Manufacturers

1. Baker Silo, Inc.

2. Or Approved Equal

2.02 APPURTENANCES

A. Design tank and accessories to applicable federal, state, and local health and safety requirements including but not limited to OSHA.

B. Top Access Hatch

1. The top access hatch shall be a double leaf 30”x48” aluminum hatch with lift assist and provisions for a padlock, fall blocks and weather stripping installed on the roof.

2. Manufacturers

a. Halliday Products, Inc.

b. Bilco, Inc.

c. Or Approved Equal

C. Grade Level Maintenance Access Hatch

1. Provide a 30”x30” minimum flanged side maintenance access hatch with a self-supporting hinge system.

D. Ladder & Safety Cage

1. Exterior ladder shall be provided per the Drawings and shall comply with current OSHA regulations.

E. Air Vent

1. The air vent shall be 8-inch diameter gooseneck located in the center of the roof with a non-corrosive screen (24 mesh).

2. Air vent design calculations shall be provided.

F. Overflow and Tank Drain

1. The overflow shall be 6-inch diameter in the sidewall as shown in the drawings.

2. The overflow shall include a non-corrodible screen.

3. The overflow shall be provided with a pipe thread at the exterior wall surface.

4. The overflow shall be piped to ground level directed away from the reservoir base.

5. The tank drain shall be 6-inch diameter in the sidewall as shown in the Drawings.

G. Roof Guardrail

1. Provide roof guardrails and toeboard in accordance with Drawings.

PART 3 - EXECUTION

3.01 GENERAL

A. In accordance with requirements set forth by regulatory agencies applicable to the construction industry and in accordance with manufacturer’s instructions, the Tank Design-Builder shall provide and require the use of personal lifesaving equipment for persons working on or about the site. As a minimum, personal lifesaving equipment shall properly address protection of those persons in the following categories:

1. Head and face protection

2. Respiratory devices (for painting)

3. Ventilation

4. Sound levels

5. Lighting

6. Temporary ladders and scaffolding

7. Welding safety practices

B. The Tank Design-Builder shall conduct all operations in a clean and sanitary manner. Special care shall be taken to keep the tank interior free of waste materials.

C. The Tank Design-Builder shall clear the area within the foundation of all leaves, trash, and other debris prior to installation of tank. All cleared materials shall be disposed of in a manner, and in areas, as directed by the Owner.

D. The Tank Design-Builder must field verify the foundation elevation and the tolerances of the in-place foundation. Any deviations must be reported to the Engineer for correction before proceeding with any work. All tank underground piping must be in place prior to the commencement of tank construction.

3.02 SITE PREPARATION & EARTHWORK

A. Complete site preparation and earthwork in accordance with the Contract Documents.

3.03 REINFORCED CONCRETE

A. Complete all concrete work in accordance with the Contract Documents.

B. Sack finish to interior tank shall be in accordance with the Contract Documents.

C. All welding work for the tank appurtenances must be done in accordance with the Contract Documents.

3.04 FIELD QUALITY CONTROL

A. Test cylinders shall be cast for each concrete pour by either the Tank Design-Builder or a certified test lab.

B. All field quality control must be done according to contract documents.

3.05 TANK HYDRAULIC TESTING & CLEANUP

A. Upon completion of all tank, the Tank Design-Builder shall remove all staging, scaffolding, containers, surplus materials and rubbish from the premises in a manner approved by the Owner and shall leave the premised in a clean and orderly condition.

B. Sack finish the walls per Contract Documents.

C. Cleaning and pressure washing.

D. Disposal of abrasive blast residue shall be in a manner consistent with guidelines set forth by the U.S. Environmental Protection Agency (USEPA).

E. See drawing sheet S-001.

3.06 PERMITS

A. Tank Design-Builder shall be responsible for obtaining building permitting from the City of Sweet Home. Owner will assist in obtaining timely permit reviews and will pay permit fees.

3.07 ACCEPTANCE

A. Acceptance by the Owner of the completed work as herein specified is subject to a guarantee by the Tank Design-Builder against any repairs, leaks or damage caused by defective workmanship or materials furnished by the Tank Design-Builder for a period of 5 (five) year after Notice of Acceptance has been issued.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Earthwork requirements for sitework, structures, roads and general earthwork, including excavation, fill, backfill, grading, and compaction; import of material; and disposal of surplus and unsuitable materials.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 31 10 00 – Site Preparation
3. Section 31 23 16.26 – Rock Excavation
4. Section 31 23 19 – Dewatering
5. Section 31 50 00 – Excavation Support and Protection

1.03 DEFINITIONS

A. Backfill: Earthwork necessary to add fill between new structures and the excavation up to the sub or finish grade.

B. Borrow Area: Area identified from which to obtain earthwork materials.

C. Cut: Earthwork necessary to remove existing material to lower the existing grade in elevation to sub or finish grade.

D. Embankment: Materials placed to form the subgrade for roadways or site improvements.

E. Excavation: Earthwork necessary to remove existing material for the installation of structures.

F. Fill: Earthwork necessary to add material to bring the existing grade up in elevation to sub or finish grade.

G. Finish Grade: Final surface following placement of surfacing, if any, as indicated.

H. Subgrade: The surface of the earthwork on which pavement, surfacing, base, subbase, or a layer of any other material is placed.

1.04 SUBMITTALS

A. Prepare submittals and submit in accordance with Section 01 33 00.

B. For imported materials, provide certification and source.

C. For excavations 5 feet or deeper: Submit detailed plan of all shoring, bracing, side sloping, or other provisions for worker protection against the hazard of caving ground during excavations in accordance with Section 31 50 00.

1.05 QUALITY ASSURANCE

A. Materials and Compaction Testing.

1. Source testing of materials: Provided and paid for by Contractor.

2. Field testing of compaction: Provided and paid for by Owner.

B. Compaction Testing Standards

1. In-place Density of Compacted Fill Material: Density determined in the field in accordance with ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

2. Maximum Dry Density of Compacted Material: determined in the laboratory in accordance with Method C of ASTM D1557-12e1 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

C. Material Testing Standards:

1. Particle size analysis of soils and aggregates: ASTM D6913 – Standard Test Methods for Particle-Size Distribution of Soils Using Sieve Analysis. ASTM D7928– Standard Test Method for Particle-Size Distribution of Fine-Grained Soils Using the Sedimentation Analysis.

2. Determination of sand equivalent value: ASTM D2419 – Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

3. Liquid limit, plastic limit, and plasticity index: ASTM D4318 – Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

4. The testing for organic matter: ASTM D2974 – Standard Test methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.

D. References in this section to soil classification types and standards shall have the meanings and definitions indicated in ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes. Contractor shall be bound by all applicable provisions of ASTM D2487 in the interpretation of soil classifications.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General fill, backfill, and embankment materials:

1. Selected or processed clean earth, rock, or sand, free from grass, roots, brush, other vegetation, corrosive and hazardous materials, manmade objects, and debris.

2. Materials not defined as unsuitable as indicated below, except some materials listed as unsuitable may be used, if indicated on the Drawings or when acceptable to the Engineer, when thoroughly mixed with suitable materials to form a stable composite.

3. Obtain suitable materials from one or more of the following:

4. Onsite excavations and designated borrow areas.

5. Processed on-site materials.

6. Onsite soils are not suitable for use as structural fill.

7. Imported from offsite borrow areas and processing plants.

8. If imported materials are required by this Section, or to meet the quantity requirements of the Project, provide the imported materials at no additional expense to Owner, unless a unit price item is included for imported materials in the Bidding Schedule.

9. Large rocky material: When embankment material consists of large rocky material, or hard lumps, such as hardpan or cemented gravel which cannot be broken down readily, distribute such material evenly throughout the embankment. Place sufficient earth or other fine material around the larger material as it is deposited so as to fill the interstices and produce a dense, compact embankment. Do not place rocks larger than 6 inches in diameter within the upper 2 feet of the embankment subgrade.

10. Further condition fill, backfill, and embedment materials as described below or as indicated on the Drawings.

B. Structural Fill

1. 1.5 inch or ¾ inch minus Dense Graded Aggregates as Defined in Section 02630-10 of the Oregon Standard Specifications for Construction

C. Structure Backfill Material

1. Open Graded Aggregate as defined in Section 2630.11 of the Oregon State Standard Specifications for Construction

D. Subgrade Stabilization material

1. Well graded granular material

2. Maximum size of 4 inches

3. Less than 5 percent passing the No. 4 Sieve

4. Free of organic material

E. Reinforcement Geotextile:

1. Permeable, woven

2. Polypropylene, polyester or a combination of both

3. Meeting requirements of Type 2 Woven Riprap Geotextile, as defined in Table 02320-2 of the Oregon State Standard Specification for Construction

4. Approved manufacturers

a. TenCate Mirafi, RS 380i

F. Sand:

1. Clean, coarse, natural sand free from organic material, suitable for the purpose intended.

2. Gradation: 90 percent to 100 percent will pass a No. 4 sieve and not more than 5 percent will pass a No. 200 sieve.

2.02 UNSUITABLE MATERIALS

A. Unsuitable materials include the materials listed below:

1. Soils which, when classified under ASTM D2487, fall in the classifications of Pt, OH, CH, MH, or OL, or in a classification that contains Pt, OH, CH, MH, or OL in combination with any other letter designation, such as CH/CL.

2. Soils which cannot be compacted sufficiently to achieve the density specified for the intended use, or are unstable or pump regardless of the degree of compaction.

3. Materials that contain hazardous or designated waste materials including petroleum hydrocarbons, pesticides, heavy metals, and any material which may be classified as hazardous or toxic according to applicable regulations.

4. Soils that contain greater concentrations of chloride or sulfate ions, or have a soil resistivity or pH less than the average values for existing onsite soils.

5. Topsoil, sludge and sludge-entrained soils.

6. Rocks, stones, and boulders larger than 6-inches in diameter.

7. Onsite soils are not suitable for use as structural fill.

2.03 SOURCE QUALITY CONTROL

A. Materials source testing will be performed by a testing laboratory by a third-party special inspections and testing firm retained by the Owner.

B. Minimum Frequency of sampling:

1. Fill, backfill and embankment material generated from earthwork activities:

2. Two soil samples every 500 cubic yard of material used.

3. Two soil samples whenever the character of the soil changes.

4. One soil sample when directed by the Engineer.

5. Obtain samples that represent the predominate character of the soil that is encountered.

6. Sampling of Imported Material

7. Obtain representative samples of product from supplier.

8. After initial testing demonstrated that the proposed borrow material meets the specified requirements, obtain and test one additional sample for every 500 cubic yard of imported material.

C. Testing:

1. Test all materials used in the Work to confirm they meet the requirements indicated.

2. Prepare moisture-density curves for use in determining the optimum moisture content and in-place density of the compacted backfill.

PART 3 - EXECUTION

3.01 EXCAVATION – GENERAL

A. Excavation includes the removal of all materials of whatever nature encountered, including all obstructions of any nature.

B. Excavation shall conform to the lines and grades indicated on the Drawings.

C. Clear, grub and strip and remove topsoil in construction and borrow areas in accordance with Section 31 10 00.

D. Excavation Stability

1. Slope excavated faces or otherwise support in a safe manner in accordance with applicable State safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926) and in accordance with Section 31 50 00.

2. Furnish, and place the supports and shoring required to maintain stability of all sides of the excavations.

E. Notify Engineer at least 1 working day in advance of completion of any structure excavation to allow inspection of the exposed subgrade before it is covered with backfill or with any construction materials.

F. Erosion Control:

1. Maintain earthwork surfaces true and smooth and protected from erosion.

2. Construct erosion control measures identified in the Erosion and Sediment Control Plan prior to any clearing or grading activity.

G. Control of Water: Control water entering the excavation as indicated in Section 31 23 19.

H. Existing Underground Utilities:

1. Known existing underground utilities are generally shown on the Drawings in their approximate locations based on information of varying accuracy.

2. Exercise care to avoid damage to all existing utilities whether shown or not.

3. Conduct field explorations to locate all underground utilities in the vicinity of the Earthwork activities in accordance with Section 31 10 00.

4. Alert the Engineer of the presence of existing utilities that are not shown on the Drawings or are in locations different than those shown on the Drawings.

I. Existing Overhead Utilities: There may be existing overhead utilities in the vicinity of the Work which may or may not be shown on the Drawings. Identify existing overhead utilities, if any, and use extreme caution when working in the vicinity of overhead utilities.

3.02 EXCAVATION FOR FILLS AND EMBANKMENTS

A. Benching and Keyways:

1. Where fill is to be placed against existing subgrade or existing grade that is sloped, excavate horizontal benches a minimum of 5 feet wide and located at vertical intervals of not more than 5 feet to provide for placement and compaction of the new fill on horizontal surfaces.

2. Excavate keyway along the base of the existing slope:

3. Extend the keyway at least 3 feet into competent native soil.

4. Width of Keyway: Minimum of 15 feet.

5. Keyway Side Slopes: Inclined at approximately 0.75:1.

6. Keyway Subgrade: Scarify the upper 8-inches of the exposed surface, moisture condition and re-compact.

B. Subgrade Preparation:

1. Subgrade Beneath Embankments:

2. Expose competent native soil within the planned new embankment footprint.

3. Scarify the exposed subgrade to a depth of 12 inches or depth to bedrock, moisture condition as necessary and re-compact.

4. Subgrade Beneath Paved Areas:

   a. Excavate to the subgrade soils beneath the bottom of the subbase.

   b. Place reinforcement geotextile as shown on drawings.

   c. Finished subgrade shall be even, self-draining, and in conformance with the slope of the finished pavement.

5. Subgrade Beneath Structures:

6. At grade structures

   1) Excavate 3 feet of undocumented fill or to basalt rock layer and replace with compacted imported structural fill.

   2) Extend imported structural fill horizontally beyond the exterior perimeter of the building and footing a distance equal to the height of the fill or 3 feet whichever is greater.

7. Below grade structures

   1) Excavate to basalt rock layer and replace with compacted imported structural fill.

   2) Provide a minimum of 2 and a maximum of 12 inches of imported structural fill as leveling course for spread and continuous footing over the basalt rock subgrade.

   3) Provide a 6-inch layer of imported structural fill for mat foundation over the basalt rock subgrade.

4) Extend imported structural fill horizontally beyond the exterior perimeter of the building and footing a distance equal to the height of the fill or 3 feet whichever is greater.

3.03 EXCAVATION IN VICINITY OF TREES

A. Except where trees are indicated to be removed, protect trees form injury during construction.

B. Do not cut tree roots over 2 inches in diameter without permission of the Engineer.

C. Support trees during excavation by means approve by the Engineer.

3.04 OVER-EXCAVATION NOT ORDERED OR INDICATED

A. Backfill areas over-excavated with the materials indicated for the backfill above the over-excavation or Aggregate Base.

B. Backfill the over-excavation to restore the required subgrade elevation and compact.

C. Any over-excavation carried below the grade indicated on the Drawings will be at no additional cost to Owner.

3.05 OVER-EXCAVATION WHERE ORDERED BY ENGINEER

A. Where ordered by the Engineer, over-excavate beyond the depth of subgrade indicated to the dimensions ordered.

B. Backfill areas over-excavated with the materials indicated for the backfill above the over-excavation or Aggregate Base.

C. Backfill the over-excavation to restore the required subgrade elevation.

D. Over-excavation less than 6 inches below the limits indicated: At no increase in cost to Owner.

E. Over-excavation greater than 6 inches below the limits indicated: Payment will be made under separate unit price bid items for over-excavation if such bid items have been established. Otherwise, payment will be made in accordance with a negotiated price.

F. Measurement and Payment

1. Measurement of quantities for payment of over-excavation: By calculation by Engineer of the volume of materials removed as over-excavation based on the difference between the excavation dimensions before and after the over-excavation work. No compensation will be made for removal of materials beyond the limits of the additional excavation ordered by Engineer or for materials which may come into the excavation from outside the designated limits. No compensation will be made for removal of materials that are outside of the minimum horizontal dimensions indicated.

2. Payment for over-excavation will be made by the cubic yard. The payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in excavating and backfilling the over-excavation completely. Payment shall also include full compensation for the removal and disposal of the excavated materials, import and installation of backfill materials, control of water in the excavation, excavation support, and all

costs associated with interruption of construction operations during the review of the foundations, over-excavation, backfill, and all other operations required for, or as a result of, over-excavation.

3.06 ROCK EXCAVATION

A. Perform rock excavation in accordance with Section 31 23 16.26.

3.07 DISPOSAL OF UNSUITABLE, EXCESS EXCAVATED AND OTHER MATERIALS

A. The Owner has identified a site for disposal of clean excess excavated earth materials located at Quarry Park, 3101 Zelkova Street, Sweet Home, Oregon 97386. The Contractor may use a different disposal site with written authorization from the property owner of the disposal site. Clean materials shall meet the requirements of Section 2.01.A.1.

B. Dispose unsuitable materials at an appropriate site selected by Contractor unless otherwise indicated.

C. Obtain required permits, landowner, and agency approvals for disposal of unsuitable and excess excavated materials and pay costs associated with the removal and disposal of the materials.

3.08 FILL AND EMBANKMENT CONSTRUCTION

A. Scarify foundation soils for fills and embankments bring to optimum moisture content, and re-compact with heavy compaction equipment to obtain compaction indicated.

B. Place and compact fill and embankments in horizontal layers so that when compacted layers to not exceed thickness indicated.

C. Provide keyways or benches where an embankment or fill is to be placed against slopes, hillsides, or fill slopes.

D. Slopes: Construct slopes as indicated except construct no permanent fill or embankment slopes with slope inclinations that exceed 2:1 (horizontal: vertical) unless specifically indicated otherwise

E. Over-construct fills and embankments beyond the horizontal dimensions than indicated. Cut back slope following placement and compaction to expose well compacted fill.

F. Construct the first 3 feet of embankment or fills over pipelines using placement and compaction equipment that do not damage the pipe. Keep heavy construction equipment a minimum distance of the edge of the trench equal to the depth of the trench until at least 3 feet of fill over the pipe has been placed and compacted.

3.09 STRUCTURE BACKFILL

A. Provide Structure Backfill material within 12-inches of all structures to be backfilled unless otherwise indicated.

B. Place a 6-inch layer of structural fill below all structures, unless otherwise indicated.

C. Do not drop backfill upon any structure or pipe.

D. Confirm concrete structures have attained sufficient strength to withstand the backfill loads imposed.

E. Do not place backfill around water retaining structures until structures have been tested and approved for backfill. Fill structures with water during backfill operations.

F. Place backfill after all water has been removed from the excavation and the excavation sidewalls and subgrade soils have dried to a moisture content suitable for compaction.

G. Remove all loose, sloughing, or caving soils and rock materials prior to placement of backfill.

H. Place geotextile fabric as indicated.

I. Promptly after removal, fill voids created by the extraction of sheetpile or shoring indicated in Section 31 50 00.

J. Place backfill and spread evenly in layers so that when compacted layers do not exceed thickness indicated.

K. Thoroughly mix layers as necessary to promote uniformity of material in each layer.

L. Add water to backfill material such that moisture content is below the optimum moisture content and mix with the soil until the proper moisture content is achieved throughout the soil layer.

M. Where backfill material moisture content is too high to permit the specified degree of compaction, dry backfill material until moisture content is satisfactory.

3.10 COMPACTION OF FILL, BACKFILL, AND EMBANKMENT MATERIALS

A. Adjust moisture condition of soils to achieve a water content of 2 percent, plus or minus 0.5 percent, above the optimum moisture content as determined through moisture density testing of the soil.

B. Compact each layer in a uniform and systematic manner.

C. For materials with less than 10 percent passing the No. 4 sieve, compact by means of at least 2 passes from a flat plate vibratory compactor.

D. For materials with 10 percent or more passing the No. 4 sieve, mechanically compact to the indicated percentage of density each layer of backfill materials.

1. Use equipment that is consistently capable of achieving the required degree of compaction.

2. Compact each layer over its entire area while the material is at the required moisture content.

E. For wall backfill placed within 3 feet of the wall use hand-operated tamping equipment, such as jumping jack or vibratory plate compactors.

F. Do not use flooding, ponding, or jetting as a method of compaction.

G. Do not use equipment weighing more than 10,000 lbs closer to structure walls than a horizontal distance equal to the depth of the fill at the time. Use hand operated power compaction equipment where use of heavier equipment is impractical or restricted due to weight limitations.

H. Compaction Requirements:

1. Where agency or utility company requirements govern, the highest compaction standards shall apply.

2. Compact finish and subgrades in compliance with the following table:

Location or Use of Fill	Limit/Layer Thickness	Percentage of Maximum Dry Density of Compacted Material per ASTM D1557
Imported Structural Fill General Use	8 in. Layers	92
Backfill within 3 feet of walls	Less than 6 in Layers	90
Upper 2 feet of backfill within 3 feet of walls when sidewalks or pavements are placed above the backfill	Less than 6 in Layers	95
Embankment Fill	12 in. Layers	90(1)
Subgrade beneath embankments or fill areas (upper 8 inches)	Upper 12 in.	92
Subgrade beneath structures	8 in. Layers.	92
Subgrade beneath keyway (upper 8 inches)	Upper 8 in.	95
Finish grade in unimproved or landscape areas	Upper 12 in.	85
(1) If embankment fill is non-moisture-density testable, compaction shall be assessed by proof-rolling per ODOT TM158 or other visual means per the Engineer.		

3.11 FIELD QUALITY CONTROL AND TESTING

A. Field quality control testing for compaction confirmation will be done by a testing laboratory of the Owner's choice at the Owner's expense except as indicated below.

B. If requested by the Owner, remove soil above the level at which the Owner wishes to test. Backfill and re-compact material after testing is completed.

C. If compaction fails to meet specified requirements, perform remedial work by one of the following methods:

1. Remove and replace backfill at proper density.

2. Bring density up to specified level by other means acceptable to Owner.

3. Retesting:

a. Costs for conducting additional tests to confirm and verify that remedial work has brought compaction within specified requirements shall be borne by the Contractor.

b. Conduct compaction tests at twice as frequently specified for the initial confirmation tests.

D. Where soil compaction is specified as a percentage of maximum dry density, determine the maximum dry density at optimum moisture content by laboratory testing in accordance with Method C of ASTM D1557.

E. Where compaction of cohesionless, free draining soil is specified as a percentage of relative density, determine relative density by laboratory testing in accordance with ASTM D1557.

F. Determine In-Place Density of Compacted Fill Material by performing field tests of soil density in accordance with ASTM D6938.

G. Frequency of Compaction Confirmation Testing at intervals not less than as follows:

1. Each lift shall be tested prior to placing a subsequent lift.

3.12 FINISH GRADES

A. Surface: Reasonably smooth and free of grade breaks, irregular surface changes, protrusions and other defects.

B. Restore un-improved areas back to pre-construction grades.

C. Backfill topsoil in all areas where the topsoil was removed as part of the site preparation.

D. Restore drainage swales and water courses to their pre-construction alignments and grades unless otherwise modified by the Work. Grade surface to drain away from structures. Direct drainage to collection points.

E. Provide smooth transitions to existing grades.

F. Repair and reestablish grades to required elevations and slopes due to any settlement or erosion that may occur prior to final acceptance.

G. Vertical Tolerance:

1. Subgrade under paved areas: 0.0 feet above and 0.08 feet below.

2. Subgrade under structures: 0.0 feet above and 0.08 feet below.

3. Landscaped areas: 0.1 feet above and 0.1 feet below.

4. Unimproved areas: 0.1 feet above and 0.1 feet below.

END OF SECTION

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SECTION 31 10 00

SITE PREPARATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Site preparation work, as follows:

1. Locating existing facilities.
2. Installing safety and protective barriers.
3. Constructing temporary access roads, work areas and storage areas.
4. Clearing, grubbing, stripping, and other initial work required for earthwork and trenching operations.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals

1.03 DEFINITIONS

A. Clearing and Grubbing: Consists of removal of natural obstructions and man-made objects and features including foundations, buildings, fences, lumber, stumps, debris, rubbish, brush, trees, boulders, and other items that interfere with construction operations or are specifically designated for removal.

B. Stripping: Includes the removal and disposal of sod, grass, weeds, roots, and other organic material remaining after clearing has been completed.

1.04 SUBMITTALS

A. Comply with Section 01 33 00.

B. Submit:

1. Materials used and layout of temporary fences
2. Proposed staging and stockpile locations.

PART 2 - PRODUCTS

2.01 TEMPORARY FENCES

A. Type: Heavyweight, high visibility, flat laminar mesh design.

B. Material: High-density polyethylene.

C. Height: 48 inches.

D. Posts: Wood or metal posts at 10-foot spacing. Secure fence to posts with plastic cable ties.

PART 3 - EXECUTION

3.01 LOCATING EXISTING FACILITIES

A. Review the design drawings, maps, and other sources of information and identify existing facilities at the site to determine and mark the approximate locations of underground facilities.

B. Follow rules adopted by the Oregon Utility Notification Center regarding locating and marking existing buried utilities and contact owners of existing underground utilities prior to beginning work in the vicinity of their utilities.

C. Locate all existing utilities by exploratory excavations after field marking by the utility agencies and prior to any excavations in the affected areas.

3.02 SAFETY AND PROTECTIVE BARRIERS

A. Along Public Roadways:

1. Install appropriate barriers such as temporary fencing, plastic drums, or concrete traffic barriers to protect public from construction areas and to protect workers and existing facilities from danger of passing vehicles.

B. Temporary Fences:

1. Prior to beginning excavation, erect temporary fences along boundaries of the work area indicated on the Drawings.

2. Maintain work activities within the confines of the temporary fences.

3. Remove temporary fences when work in the vicinity is substantially complete.

C. Existing Trees: Erect temporary fences around trees at the drip line that are adjacent to the Work and may be subject to damage unless protected. Maintain work activities outside of protected areas.

D. Provide protective concrete slabs, steel plates or encasements for existing buried facilities that may be damaged by Contractor's equipment and vehicles.

3.03 PRIMARY SITE ACCESS, WORK AND STORAGE AREAS

A. Coordinate with the Owner and Engineer to develop primary access routes, work areas and storage areas.

B. Protect subgrade soils in stripped and graded areas as follows:

1. Place a minimum of 12 inches of crushed rock base material in temporary construction traffic areas.

2. Place a 18-24 inches of crushed rock base material to as necessary to protect subgrade soils in heavily traveled construction traffic areas.

3. Place a minimum of 4 inches of crushed rock base material in pedestrian areas.

C. Clean up areas at the conclusion of the project and return the areas to their original or better condition.

3.04 CLEARING

A. Clear construction areas of objectionable items and material, which, if left in place, would interfere with the proper performance of the work.

B. Remove loose boulders within 10 feet from the tops of cut slopes. Incorporate boulders into landscaping or remove from the site.

C. Dispose of material from clearing operations in an acceptable off-site location.

3.05 STRIPPING

A. Remove the top layer of soil containing sod, grass, weeds, other vegetation, and organic material to a depth of 6 inches from areas that will be affected by construction and site grading operations.

B. Extend stripped areas at least 4 feet beyond the limits of cut and fill areas.

C. Protect soils in stripped areas as described in Section 3.03.

D. Dispose of stripped material in an acceptable off-site location.

3.06 REMOVAL OF EROSION CONTROL DEVICES

A. Remove erosion control devices when bare soils are sufficiently revegetated to prevent on-site or off-site soil erosion, if authorized by the Engineer.

B. Straw wattles containing plastic netting, including plastic specified as phot-degradable, may not remain on site. Remove entire wattle or remove and dispose of plastic netting and spread straw from wattle across vegetated areas of site.

3.07 TREE REMOVAL

A. Remove specific trees indicated on the Drawings for removal.

B. Timber Salvage: Property owners have the rights to any tree with caliper of 6 inches and larger that are felled. The Engineer will notify property owners at least 48 hours prior to tree removal. If property owners elect to keep felled trees, they will be granted 7 calendar days after the tree is felled to remove the timber. If timber is not removed after 7 calendar days, the ownership of the timber shall revert back to Contractor.

END OF SECTION

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SECTION 31 23 16.26

ROCK EXCAVATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Rock excavation exceeding the capability of conventional equipment.

B. Blasting requirements.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals

2. Section 31 00 00 – Earthwork

1.03 DEFINITIONS

A. Rock Excavation.

1. General:

a. Removal of solid material which by actual demonstration cannot, in Owner's Representative's opinion, be reasonably removed using conventional excavation equipment and must be systematically broken by power-operated hammer, hydraulic rock breaker, expansive compounds, blasting, or other similar means prior to removal.

b. For excavation of solid material that cannot be removed using an excavator or tractor in good working condition having a minimum flywheel power of 220-mechanical horsepower (164 kilowatt) and equipped with manufacturer's standard boom, single tooth rock ripper, and rock points on a rock ripping bucket no wider than 36 inches, or similar approved equipment, will be considered rock for the purpose of payment.

2. Term "rock excavation" indicates removal of solid material, as specified above, and does not necessarily correspond to "rock" or "bedrock" as implied by names, geologic formations, or other definitions provided in the Oregon Standard Specifications for Construction or other documents outside of this specification.

1.04 SUBMITTALS

A. Submit the following shop drawings, plans and product information per Section 01 33 00:

1. Permits: The Contractor shall obtain all required local, State, Federal, and the utility owners' permits and shall submit to the Owner's Representative, a copy of all applicable permits for transportation, storage, and use of explosives.

2. At least 28 days prior to drilling any blast hole, the submit the resumes for the Owner's Representative's approval the resumes of the Contractor's Blasting Consultant, Blasting Supervisors (Blasters-In-Charge), and personnel performing preconstruction blast surveys.

3. At least 28 days prior to drilling any blast holes, the submit a Project-specific General Blasting Plan to the Owner's Representative for review. The Contractor's Blasting Consultant shall visit the Site and prepare the Plan. The plan should include:

    a. A scaled plan drawing showing the approximate location and extent of the Contractor's blasting operations.

    b. A schedule of neighborhood pre-blast advisories, notifications and pre-blast structural surveys; a description of shot clearing and guarding procedures.

    c. A description of the anticipated road closures required during blasting operation,

    d. A tabulation of the nearest distances to structures within the specified blast generated seismic influence zone.

    e. A description of the drill and blast operation providing: the blast hole diameters and range of depths, the types of explosive to be used, the length of the stemming columns and the type of stemming material, the type of initiation system to be used, the methods used to control fly rock and sufficient information to determine the acceptability of the proposed blasting, and conformance with Paragraph 3.03.D, Blasting Limitations, hereinafter.

4. For each kind of blasting agents and explosives to be used, submit the perchlorate content provided by the suppliers and/or manufacturers. The Contractor has to obtain written permission from the Owner's Representative to use perchlorate-containing explosive products.

5. At least 14 days prior to drilling any blast holes the submit to the Owner's Representative manufacturer's product information sheets and Material Safety Data Sheets (MSDS) for all explosives, blasting agents, primers, and initiating products the Contractor proposes to use.

6. At least 24 hours before drilling any blast holes, the submit a Site-Specific Pre-blasting Blast Plan to the Owner's Representative for review and approval. The Pre-blasting Site-Specific Blast Plan shall include the following minimum information:

    a. A Site-specific plan view showing the blast area(s) and distances from the blast to all structures within 300 feet. The plan shall show the locations and distance to buried structures including buried utilities and pipelines within 100 feet of blast areas. Should the rock excavation require more than one blast, the plan shall show the anticipated footprint of each blast and the sequence in which the blasting will occur.

    b. A section view or profile of the blast area showing the top of ground, the rock/overburden contact and the bottom elevation limits of the excavation.

    c. The maximum weight of explosives to be detonated in any discrete 8 millisecond incremental time period.

7. Review and approval of any blasting plan by the Owner's Representative shall not relieve the Contractor of their responsibility for obtaining adequate rock breakage and limiting rock breakage to within the design excavation final lines and grades.

8. Submit a Blast Report Form or approved equal to the Owner's Representative before 9 am the day following each blast. The report shall contain the information required in Paragraph 3.03.G, Blasting Records.

9. Pre-blast Survey: At least 7 days prior to loading blastholes, submit Pre-blast Inspection Report including the information described in Section 1.07.

1.05 REFERENCES

A. Oregon Occupational Safety and Health Code (OR-OSHA), Division 3 Construction, Subdivision U – "Blasting and Use of Explosives," Sections 1926.900 through 1926.914.

B. Oregon Revised Statutes for Explosives, 480.010 through 480.290 and Administrative rules 837-12-1200 through 837-12-1420. The rules are administered by Oregon's Office of State Fire Marshal and govern the sale, possession, transfer of explosives, and the required certificates.

C. Code of Federal Regulations (CFR): Bureau of Alcohol, Tobacco, and Firearms (ATF): 27 CFR 555.

D. National Fire Protection Association:

1. 495: Explosive Materials Code.

E. Blast Vibration Monitoring:

1. International Society of Explosive Engineers (ISEE), 2011, Blaster's Handbook, 18th edition, Appendix E, Seismograph Field Practice Guidelines.

1.06 QUALIFICATION OF BLASTING PERSONNEL

A. Provide the services of an independent, qualified Blasting Consultant, experienced in controlled and sinking cut blasting techniques for similar civil and hydraulic works, to prepare blasting plans, to supervise the installation of instruments, and to supervise the interpretation of recorded results. The Blasting Consultant shall have at least 10 years of experience and demonstrate satisfactory experience on 5 similar projects. These projects shall include blasting within 100 feet of occupied dwellings or utilities where good relations with owners of nearby private structures or utility and the public were maintained. The Blasting Consultant shall not be an employee of the Contractor, explosives manufacturer, or explosives distributor. The Owner's Representative shall review and approve or reject the Blasting Consultant.

B. Use experienced, competent Supervisors (Blasters-In-Charge) for all blasting operations. All blasting supervisors shall have at least 10 years of experience and be able to demonstrate satisfactory experience on at least 5 similar projects, including blasting within 100 feet of occupied dwellings or utilities. All blasters and blasting supervisors shall be properly qualified and licensed in accordance with applicable federal, state, and local regulations. The Contractor shall not allow prohibited persons as defined by the BATF (27 CFR Part 555) to transport, handle, or use explosive materials.

C. Use experienced and qualified personnel for conducting pre-blast condition surveys. Personnel conducting pre-blast surveys shall have at least 5 years of experience in conducting pre-blast condition surveys of structures and be able to demonstrate satisfactory experience on at least 3 similar projects. Personnel conducting pre-blast surveys shall be the employees of a firm regularly engaged in conducting such surveys and shall not be an employee of the Contractor or any explosives manufacturer or distributor.

1.07 QUALITY CONTROL AND ASSURANCE

A. Pre-blast/Post-blast Inspections:

1. Coordinate all necessary notifications with utility owners of any utilities within 100 feet of the blast.

2. Prior to blasting, inspections shall be made of residences and other private structures existing within a 300-foot radius of all blasting locations. Notify the Owner's Representative at least 7 days prior to the inspections so a representative of the Owner's Representative may be present.

3. Inspections shall meet the following conditions: The survey shall include documentation of interior subgrade and above grade accessible walls, ceilings, floors, roof, and visible exterior as viewed from grade level. It shall detail by videotape or photographs and notes and sketches the existing condition or structures. Existing crack damage, other structural problems or defects occurring inside and outside the structure shall be documented as follows:

   a. The location of the feature shall be noted on a scaled drawing,

   b. Feature dimensions (e.g. width, length, depth) shall be measured and documented.

   c. Feature shall be photo-documented. A scale such as a ruler or crack meter shall be included in the photograph.

4. Develop a pre-blast inspection report, including videotapes and photographs, and shall be submitted to the Owner's Representative. Photographs shall be electronically imported and included in the report. Scans of photographs shall not be allowed.

5. As construction progresses, reinspect, as often as necessary to verify that controlled blasting methods are not causing any new damage.

6. In the event any property owner denies access for the survey of structures within the specified limits, notify such property owner by certified mail, on the intent of the survey. If after 2 weeks, access is still denied, notify the property owner once again that this is the final notification. Submit two copies of all such correspondence to the Owner's Representative. Upon review of the correspondence, the Owner's Representative may waive the inspection requirements for property owned by the owners refusing access.

7. Post blast inspections shall be required for property where written or verbal damage complaints were made by property owners.

B. Damage Repair

1. In case damage from blasting occurs to existing structures, to any portion of the Work, or to the material surrounding or supporting the same that is intended to remain, remove such damaged Work, repair the work, and replace the material and perform such Work for repair or replacement as the Owner's Representative deems necessary. Repair all damage promptly, completely, and satisfactorily, at the Contractor 's sole expense.

2. Nothing contained herein shall relieve the Contractor of their responsibility for claims arising from the Contractor's construction operations, including blasting operations. Failure to inspect any structure required by these Contract Documents, or inadequacy of inspections shall not relieve the Contractor of their responsibility. The Contractor shall indemnify the Owner and the Owner's Representative for such claims.

1.08 SAFETY REQUIREMENTS

A. Explosives shall be handled, transported, used, controlled, and monitored as prescribed by the most stringent of rules specified in the referenced OSHA and ATF Standards, Oregon's Office of State Fire Marshal explosives regulations, this Section, and local codes and ordinances.

B. Keep explosives on the Site only in such quantity as needed for Work under way and only during time as being used. No overnight magazine storage of explosives shall be allowed within the Project limits. Only the amount of explosives to be used each day shall be on the Site. Promptly remove from premises remaining unused explosives and explosive product packaging materials when need for explosives has ended. All loaded blast holes are to be shot the day they are loaded.

C. Conform to State, Federal, and municipal laws, ordinances, and regulations relating to transportation, handling, and use of explosives. If any of above-mentioned laws, ordinances, or regulations require a licensed blaster to perform or supervise the Work of blasting, employ a licensed blaster. Require them to have a license on Site and permit examination by Owner's Representative or other officials having jurisdiction.

D. Conduct operations involving explosives with all possible care to avoid injury to persons and property. Do blasting only with such quantities and strengths of explosives and in such manner as will break rock approximately to intended lines and grades, leaving rock not to be excavated in an unshattered condition. Avoid excessive cracking of rock upon or against which any structure will be built. Prevent injury to existing pipes, structures, and property above or below ground. Cover rock with logs or mats, or both. Give sufficient warning to persons in vicinity of Work before a charge is exploded.

E. Complete blasting within a distance of 50 feet (15 m) before any portion of a masonry structure is placed or any pipe is laid.

F. Determine presence of two-way-radios, stray electrical currents and other conditions adversely affecting blasting operations and implement necessary precautions to prevent accidents and premature blasts.

1.09 SITE CONDITIONS

A. Protect structures, underground utilities, and other construction from damaged caused by blasting.

B. Subsurface conditions at the wastewater treatment plant are described in the Geotechnical Data Report prepared for this Project – see Supplementary Information in Volume 3 of the Contract Documents. It is the responsibility of the Contractor and the Contractor's Blasting Consultant to review and understand the rock mass characteristics at the Site.

PART 2 - MATERIALS

2.01 EXPLOSIVE PRODUCTS

A. To the extent practical, avoid the use of perchlorate-containing explosive products when surface or groundwater can be affected.

2.02 WARNING SYSTEMS

A. Institute a system of audible signals to warn of impending blasts.

B. Erect signboards of adequate size stating that blasting operations are taking place in the area. Such signs shall be clearly visible at all points of access to the area and shall clearly describe the audible signal system for warning of impending blasts.

C. Mark all day storage places and explosives transport vehicles with signs stating clearly and boldly, DANGEROUS EXPLOSIVES.

2.03 BLAST MONITORING INSTRUMENTATION

A. The Contractor with the assistance of the Contractor's Blasting Consultant shall provide and operate a minimum of three blast monitoring seismographs, at locations shown on the Drawings, to record particle velocity simultaneously along three mutually perpendicular axes.

B. Provide and operate a minimum of two approved air blast overpressure/sound monitoring devices at locations as directed by the Owner's Representative.

C. Blast monitoring instrumentation shall be 4-channel, (1 overpressure and 3 seismic channels) units capable of digitally storing collected data. Equipment shall be capable of printing ground motion time histories and summaries of peak motion intensities, frequencies, and USBM RI8507 ppv-frequency plots. Printed report records shall include date, time of recording, operator name, instrument-number, and date of last calibration. Instruments shall have a flat frequency response between 2 and 250 hertz (Hz) for particle velocity and from 2 to 200 Hz for air pressure.

D. Seismographs shall be capable of recording overpressure from 88 to 148 decibels (dBL), and a particle velocity from 0.005 to 10.0 ips, and shall be capable of performing a self-test of velocity transducers and printed event record shall indicate whether or not the sensor test was successful.

E. Blast monitoring equipment shall have been calibrated within 1 year of any blast monitoring.

F. Blast vibration monitoring shall be performed in general agreement with the 18th edition of the Blaster's Handbook, Appendix E, Seismograph Field Practice Guidelines, published by the International Society of Explosive Engineers (ISEE), 2011.

2.04 BLASTING MATS

A. Blasting mats shall weigh at least 25 pounds per square foot. Mats shall be a minimum of 6 feet by 10 feet and shall be equipped with suitable placement attachments.

PART 3 - EXECUTION

3.01 ROCK EXCAVATION

A. Conduct excavation in accordance with Section 31 00 00 and this Section 31 26 16.13.

B. If material is encountered that cannot be excavated by conventional equipment, notify Engineer immediately. Provide performance tests of the specified conventional or equivalent equipment demonstrating the equipment can perform to at least the level specified. If Engineer confirms in writing that the specified conventional equipment cannot perform at the production rates specified, the excavation shall be considered rock excavation.

C. A boulder may be considered rock excavation if, after the boulder has been exposed by excavation on all sides, neither type of conventional equipment can break up the boulder into pieces sufficiently small to enable removal by the specified equipment.

3.02 MEASUREMENT AND PAYMENT

A. Payment for rock excavation will be as provided in the Bid form as a unit price item for quantities in excess of the base bid quantity included in Contractor's lump sum bid. Payment for additional rock excavation shall be at the additive or deductive unit prices provided on the Bid Form.

B. Measurement and Payment

1. Measurement of quantities for payment of rock excavation shall be by calculation by Engineer of the volume of in-place materials removed as rock excavation. No compensation will be made for removal of materials beyond the limits of the rock excavation in the project drawings or ordered by Engineer or for materials which may come into the excavation from outside the designated limits. No compensation will be made for excavation wider or deeper than the minimum indicated.

2. Payment for rock excavation will be made by the cubic yard unless otherwise indicated. The payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in excavating and backfilling the excavation completely, subgrade elevation indicated. Payment shall also include full compensation for the removal and disposal of the excavated materials, control of water in the excavation, excavation support, performance tests, costs associated with interruption of construction operations during performance tests and confirmation by Engineer, costs associated with the additional time required for excavation, and all other costs and operations required for, or as a result of, rock excavation.

3.03 EXPLOSIVES AND BLASTING

A. General

1. Conduct blasting, storage and handling of explosives in accordance with the Oregon Occupational Safety and Health Division (Oregon OSHA), Oregon Administrative Rules, Chapter 437, Division 3 Construction, Subdivision U, and Section 00335 of the Oregon Standard Specifications for Construction and any other authorities having jurisdiction.

2. Obtain all necessary permits and furnish copies to Engineer before explosives are transported to the Site.

3. Pay for permits at no additional cost to Owner.

4. Perform blasting only by skilled operators under the direction of a licensed blasting supervisor.

5. Submit blasting plan prepared by qualified person. Blasting plan to include

   a. Details of drilling and blasting pattern

   b. Vibration, flyrock and noise reduction methods

   c. Blast area security measures

   d. Traffic control

6. Identify all property, structures, and persons that may be affected by blasting and take all safety precautions and protective measures to prevent damage or injury to same.

7. All personal injury or damage to persons or property of any nature, whether in the Work or appurtenant to it, shall be the responsibility of Contractor.

8. Contractor agrees by submission of a bid to indemnify and hold Owner, its officers, agents, employees, and Engineer harmless from any and all liability claims, costs, and expenses as a result of blasting operations, including expenses of investigation and defending against same in regard thereto.

9. Perform basting only between 9:00 AM and 4:00 PM, Monday through Friday, except legal holidays, unless otherwise approved by Engineer and regulatory agencies having jurisdiction.

B. Blasting

1. Perform instrumented seismographic monitoring of blasting.

   a. Place a seismograph at the nearest structure to the blast to monitor the ground motion particle velocity and frequency during each blast.

   b. Provide one copy of each seismograph chart to Engineer.

   c. If blast results in unacceptable vibrations modify the blasting procedure.

2. Contain fly rock from blasting within the project site and prevent hazard to persons, vehicles, existing improvements, or vegetation.

3. Clean the blasting site of all debris at the end of each day.

4. Do not blast within 100 feet of concrete that has cured less than 7 days.

C. Blasting Limitations

1. The following limitations are mandatory for all blasting operations:

2. Road Closure Limitations:

   a. Road closures are required during blasting all blasts. Submit any anticipated road closures in the General Blasting Plan, per Paragraph 1.04 of tis Section. Traffic control for the road closures shall be in accordance with the most recent ODOT Traffic Control Plan Design Manual.

3. Work Hour Restrictions

   a. Blasting shall be performed between XX am and XX pm. No nighttime blasting shall be allowed.

D. Blasting Safeguards

1. The maximum charge weight per 8 millisecond (MS) delay shall be in accordance with the Scale Distance Formula, $W= (D/Sd)^2$, where W = weight of explosives per 8 MS delay, D = distance in feet to structure, Sd = selected scaled distance from test blasting, unless otherwise specified by the Owner's Representative.

2. The maximum charge weight per 8 millisecond delay (MS) delay shall be approximated by the use of the following equation, which shall be refined based on test blasts and experience gained as the Work progresses: $W = D^2 * (V/H)^{1.25}$, where W = maximum weight of explosives per delay period of 8 MS, in pounds, V = peak particle velocity, in inches per second, D = shortest distance between blast and the point of interest in feet and H = ground response factor, which equals 70 (unit-less) and shall be verified by test blasting, unless otherwise specified by the Owner's Representative.

3. The first blasting operation at each location shall be monitored by the Contractor as a test case, and the proper drill and blast parameters subsequently used shall be derived from the test results. The Scaled Distance for test shots shall be based on the Contractor's General Blasting Plan and such that the peak particle velocity at the nearest residence, private, public, community, or institutional building does not exceed 2.0 inches per second, or as directed by the Owner's Representative. Blast monitoring shall be continued for every blast round. Blast monitoring data recorded for each shot shall be furnished to the Owner's Representative prior to drilling for the next blast. Changes in drilling patterns and amount of explosives shall be made when records indicate vibration in excess of that specified herein.

4. If the measured air overpressure exceeds 0.014 psi (133 dB) at the nearest occupied dwelling adjacent to the blast zone or other designated location, the Owner's Representative may require up to a 3-day shutdown of Contractor's operations for inspection of facilities. This delay shall be at no additional cost to the Owner and shall not constitute the basis for any claim.

5. If for any blast, the measured peak particle velocity or airblast exceeds the limits in this specification, the Contractor's Blasting Specialist shall review the Contractor's blasting methods and the Contractor shall submit a revised Blasting

Plan for the Owner's Representative's approval to conducting additional blasting activities.

6. In reporting a shot, the distance from the shot to each recorder, the amount of explosives used in each delay, the total amount of explosives used, and the time shall be noted. No separate or direct payment shall be made for monitoring of blasts, as all costs shall be considered incidental to, and included in, the applicable items of the Contract.

7. Cover the area to be shot with blasting mats or other approved type of protective material that will prevent the scattering of rock or other fragments. Give ample warning to all persons within the vicinity prior to blasting and provide signals warning of danger in suitable places to alert people in vehicles before firing any blasts. If flyrock projects past the guarded area of the shot or lands on private property, all blasting operations shall cease until the Contractor's Blasting Consultant reviews the Site and determines the cause of the flyrock and submits a revised shot plan for the Owner's Representative's approval.

8. After a blast has been fired, the blaster shall make a careful inspection to determine that all charges have exploded before employees are allowed to return to the operation. Misfires shall be corrected in accordance with the requirements of the applicable portions of Federal, State, and/or local safety codes for blasting. The Contractor shall be responsible for any and all damages to property or injury to persons resulting from blasting, or accidental or premature explosions that may occur in connection with the use of explosives.

9. All loose and shattered rock or other loose material, which may endanger any structure or the workers, shall be removed and the excavation made safe before proceeding with the Work. After muck removal and before drilling of blast holes for a new round, the face shall be cleaned and thoroughly examined for missed holes and unexploded powder. Blasting techniques shall be developed and improved as Work progresses. The fact that the removal of loose or shattered rock or other loose material may enlarge the excavation beyond the required limits shall not relieve the Contractor of the responsibility for removal of such material.

10. Whenever, in the opinion of the Owner's Representative, proposed blasting may cause harm to persons or private property, cause damage to structures, or create rock face instability, cease blasting immediately and review the blast design. The Contractor can resume excavation of the rock after redesigned blast plan has been approved by the Owner's Representative or by mechanical methods.

E. Blasting Test Shots

1. The Contractor shall demonstrate that the proposed blasting method meets the Project objective to the Owner's Representative by making test shots.

2. Test shots may form final rock faces upon approval of the Owner's Representative.

3. The first sinking cut shot in the shaft shall be a test blast.

4. The Contractor's Blasting Consultant shall be present to witness each test blast.

5. The Owner's Representative shall be the sole judge as to the acceptability of the proposed method. If the test is unacceptable, the Contractor, with the assistance of the Blasting Consultant, shall modify their proposed blasting method and perform additional tests until the method is acceptable.

F. Blasting Records

1. Complete the Blast Report Form for each blast detonated, and be submit to the Owner's Representative along with a Blasting Ground Motion Record (seismograph and airblast record) before 9 AM of the following day after each blast. This record shall include the following:

   a. Depth of blast holes and the location of the blast point in relation to Project stationing; type and strength of explosives, type of blasting caps, and distribution of delays used; vibration record including USBM RI8507 ppv-frequency plot; total explosive loadings per round and per delay; comments by the blaster in charge regarding any misfires, unusual results or unusual effects; date and initiation time of blast; name and signature of the Blaster-in-Charge and any other records required by State, Federal, and local codes and/or regulations.

   b. Failure to submit the Blast Report Form shall be grounds for the Owner's Representative to suspend the Contractor's drilling and blasting operations until the required reports have been submitted.

G. Post-Blast Investigation and Report

1. Perform post-blast inspections of each structure included in the pre-blast survey.

2. Perform post-blast inspections with a qualified independent inspector provided by the Contractor.

3. Use pre-blast survey forms for each structure to indicate no damage has occurred as a result of the blasting operation, sign forms following inspection, and submit one copy to the Owner.

4. Where damage has occurred, investigate the damage and provide a written report to Engineer within 30 days of identification of the damage or receipt of the complaint.

END OF SECTION

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SECTION 31 23 19

DEWATERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Control of water and dewatering of trench and structure excavations.

1.02 RESPONSIBILITY FOR DESIGN

A. Assume responsibility for planning, design, installation and operation of temporary groundwater dewatering systems and temporary surface water control systems. Water control systems designed and installed by the Contractor shall adequately protect existing property, foundations and permanent structures.

B. Utilize the services of a Registered Hydrogeologist, Professional Civil Engineer, or Certified Engineering Geologist to develop the Groundwater Control Plan (GWCP) and the design of the groundwater and surface water control systems to achieve specified results. Professional registration shall be for the State of Oregon.

C. Assume sole responsibility for loss or damage resulting from partial or complete failure of operation of dewatering systems.

D. Assume responsibility for repairing damage to adjacent properties, buildings, structures, utilities and other work due to settlement or resultant damage caused by the groundwater control operations.

E. Determine means and methods for disposing of water removed by dewatering systems. If permit requirements specify water quality requirements that must be met before water can be disposed, provide the necessary treatment facilities to achieve the specified water quality limits

F. Modify groundwater control systems or operations if they cause or threaten to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells, or affect potentially contaminated areas.

G. When additional information is needed for design of dewatering systems, conduct subsurface investigations to identify groundwater conditions and to provide parameters for design, installation, and operation of groundwater control systems

1.03 RESPONSIBILITY FOR SECURING PERMITS

A. Obtain all necessary permits, including those required by Oregon Water Resources Department (OWRD) for dewatering wells and monitoring wells, a 1200-C Storm Water Discharge General Permit from the Oregon Department of Environmental Quality (DEQ) for discharge of groundwater, and those required by the City of Sweet Home for discharge to the local sewer system.

B. Pay all costs associated with permitting, decommissioning and removal of all dewatering systems when no longer in use.

C. Comply with the sampling, testing, monitoring, and reporting requirements specified in permits secured for dewatering operations.

1.04 PERFORMANCE REQUIREMENTS

A. General

1. Groundwater control systems may include single-stage or multiple-stage well point systems, sump pumps within excavations, shallow or deep wells, or combinations of these types of dewatering systems.

2. Locate groundwater control and drainage systems so as not to interfere with utilities, construction operations, vehicular traffic, adjacent properties, or adjacent water wells.

3. Modify dewatering procedures which cause, or threaten to cause, damage to new or existing facilities, so as to prevent further damage. Install settlement gauges, as necessary, to monitor settlement of critical structures or facilities adjacent to areas of dewatering. Control the rate of dewatering to avoid all objectionable settlement and subsidence.

4. Install piezometers to monitor groundwater in the area of the excavation, as well as the natural groundwater elevation. Install piezometers in the locations specified elsewhere in this Section.

5. Remove or abandon dewatering system when it is no longer needed in accordance with regulatory stipulations indicated in this Section.

B. Project Conditions

1. Anticipate encountering groundwater in all excavations.

2. Groundwater may be free-flowing into excavations or may be encountered in the form of saturated soil.

C. Requirements for Dewatering of Excavations:

1. Design dewatering systems of sufficient scope, size, and capacity to accomplish the following results:

a. Control the flow of surface water into trench and structure excavations by grading, dikes, or other means.

b. Lower groundwater levels and eliminate infiltration of groundwater into trench and structure excavations, allowing construction to proceed on dry, stable subgrade.

c. Lower and maintain groundwater below the lowest point of excavations.

d. Lower groundwater levels further when necessary to prevent flotation and damage from hydrostatic pressure and to obtain the specified degree of compaction. Develop substantially dry and stable subgrade for subsequent earthwork compaction and construction operations.

e. Prevent the loss of fines, seepage, boils, quick conditions, or softening of the foundation soils.

f. Maintain stability of sides and bottoms of excavations.

D. Requirements for Protection of Existing Structures

1. Provide, operate and maintain dewatering systems of sufficient size and capacity to protect existing structures from hydrostatic uplift when the structure is drained of water.

2. Protection against hydrostatic uplift entails lowering the groundwater table in the immediate vicinity of the structure to be drained until the groundwater elevation is at least 12 inches below the top of slab elevation of the structure.

E. Operation of Dewatering Systems

1. Maintain dewatering operations to control and minimize erosion, to create stable sides and bottoms of excavations, to stabilize constructed slopes and to prevent settlement and damage to structures and utilities.

2. Collect and dispose of removed water. Water removed by dewatering systems cannot be discharged into the storm water collection system which consists of pipes, catch basins, manholes and roadside drainage ditches. Discharge water to wastewater treatment plant. Coordinate discharge location, quality and quantities with City prior to discharge.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Comply with requirements of agencies having jurisdiction.

B. Comply with all laws and regulations for development, drilling, and abandonment of wells used in dewatering systems.

C. Obtain a 1200-C Storm Water Discharge General Permit from the Oregon Department of Environmental Quality (DEQ) under the National Pollutant Discharge Elimination System (NPDES) for discharge of collected groundwater from the construction site.

D. Obtain all necessary permits from agencies with regulatory jurisdiction over groundwater pumping, matters affecting well installation and the use of existing storm drains and natural water drainage courses.

E. Take early action and allow time for the review, as permitting processes may be lengthy. Take early action to pursue and submit for the required approvals.

1.06 SUBMITTALS

A. Notify the Owner's Representative immediately after any material change or proposed change in the character, volume, treatment or disposal methods of the discharge.

B. Additional Shop Drawings for Specific Locations

1. Submit design details of dewatering systems and water treatment systems that will be utilized at the specific locations listed herein.

2. Design of the dewatering system shall be prepared by a Registered Hydrogeologist, Professional Civil Engineer, or Certified Engineering Geologist registered in the state of Oregon and shall be coordinated with the design of the excavation support systems that the Contractor proposes to use at these locations.

3. Provide shop drawings that are signed and sealed by the responsible Engineer or Certified Professional licensed in Oregon.

4. Illustrate the arrangement, locations and details of the dewatering system, including wells and well points; dewatering pumps and piezometers; locations of headers, treatment systems and discharge lines; standby equipment and power supply; silt removal, pollution control and treatment facilities; and the means of conveyance, discharge and disposal of water.

5. Include a narrative report outlining the dewatering procedures and controls.

6. Submit a minimum of six weeks before any work referred to in the submittal is scheduled to commence.

C. Groundwater Control Plan (GWCP)

1. Proposed plan for the design, control, transport, treatment, operation, disposal of water, signed and sealed by the designer. Include with this proposed plan a drawing that indicates the number and location of the dewatering wells to be installed for the Work.

2. Include the following in the GWCP:

a. Calculations for the design of each system, including a statement of design assumptions, system description, and basic design criteria. Quantify the peak discharge rate of each system into receiving storm water and sanitary sewers.

b. Schedule and procedures for installation, start-up testing protocol, and removal of each system.

c. Location, dimensions, and capacity of wells, retention basins, treatment ponds, tanks, and treatment plants.

d. Sizes, locations, and types of discharge lines, ditches, sumps, and flow measurement devices.

e. Details of dewatering systems for shafts, including well sizes, locations, gradation of filter materials, and calculations for compatibility with screen and ground.

f. Types, capacities and numbers of pumps, generators, and standby units.

g. Design and construction of all electrical installations.

h. Details for the collection of water in tunnel and shafts, its conveyance to the treatment point, its treatment of the water, and its discharge from the site.

i. Methods of measuring the flows in accordance with the requirements specified herein.

j. List of substances that may be introduced into discharges or increased in concentration due to the Contractor's means and methods of performing the Work.

k. Methods of monitoring groundwater level and water quality to check its compliance with all regulatory requirements prior to its discharge from the site.

l. Methods for diverting or collecting, monitoring, and treating as necessary prior to discharge all storm water.

m. Methods for collecting, handling, treating and disposing of water and byproducts from excavated materials stockpiled on site.

n. Copy of approved permits (i.e. discharge permits).

o. Copies of all daily reports specified herein.

3. Timing: Submit GWCP within 21 calendar days of the Notice to Proceed.

1.07 QUALITY CONTROL

A. Qualifications:

1. Name, address, phone number and professional registration of the designer of the dewatering systems.

2. Company and individuals responsible for the operation of the facilities.

3. Independent testing laboratory responsible for testing treated effluent will be arranged for and provided by the City.

B. Certifications: Permit for discharge into local storm water and sewer systems.

C. Quality Control Plans

1. Method for assuring that water quality complies with regulatory requirements prior to its discharge from the site.

2. Methods demonstrating the ability of the automatic paging facilities, power transfer facilities, and backup systems to comply with specified requirements.

3. Methods for assuring that collection, handling, treatment, and discharge operations do not damage the Work in progress or impact the efficiency with which other Work is performed.

4. Calculations demonstrating capacity of system to store collected water on site to comply with permit restrictions for discharging.

5. Recordkeeping: Flow, water quality, and amount and type of treatment chemicals used on a cumulative basis. Provide daily, no later than 8 hours after records were taken.

D. Shop drawings of the dewatering system must be approved prior to beginning excavations.

1.08 QUALITY ASSURANCE

A. Reference Standards: Except as otherwise indicated the current editions of the following specifications and standards apply to the Work of this Section:

1. Oregon Administrative Regulations (OAR):

a. OAR 690-200, Well Construction and Maintenance.

b. OAR 60-210, Abandonment of Wells.

c. OAR 690-240 Construction, Maintenance, Alteration, Conversion and Abandonment of Monitoring Wells Geotechnical Wells, and Other Holes in Oregon.

2. Environmental Protection Agency (EPA)

   a. 40 CFR 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants.

   b. 40 CFR 261 - Identification and Listing of Hazardous Waste.

   c. 40 CFR 403 - General Pretreatment Regulations for Existing and New Sources of Pollution.

3. Qualifications:

   a. Designer of GWCP: Registered Hydrogeologist, Professional Civil Engineer, or Certified Engineering Geologist registered in the State of Oregon with a minimum of five years experience in the design, including monitoring and recording, of water collection, handling, and treatment systems similar to those required under this Contract.

   b. Installer and Operator:

      1) Company with at least five years experience in responsible charge of the installation and operation of water collection, handling, and treatment systems similar to those required for this project.

      2) Personnel operating and maintaining facilities with demonstrated experience in the operation of systems similar to those required for this project.

4. Preconstruction Meeting: Prior to beginning excavation, complete installation of the water treatment facility and arrange for a demonstration and test of all features, including automatic paging facilities, power transfer facilities and backup systems.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Furnish and maintain all materials, tools, equipment, facilities, and services as required for providing the necessary dewatering work and facilities.

B. Materials for Groundwater Extraction Wells and Groundwater Monitoring Wells:

1. Well Casing: Schedule 40 PVC or steel pipe. Size to be determined by Contractor, 8-inch minimum.

2. Groundwater Monitoring Well Casing: 2-inch diameter PVC pipe with 20 foot section of slotted screen.

3. Sand Pack: 10-20 silica sand.

4. Pump Size, Capacity, and Type (Extraction Wells): As selected by Contractor.

5. Provide locking security cap on top of well casing.

C. Collection and Discharge Pipes: Steel or PVC pipe and fittings.

D. Water Quality Treatment Equipment: Provide settling tanks with sufficient capacity for the flow rate and volume of water. Include chemical flocculation and filtration equipment as necessary to comply with water quality limits.

2.02 DEWATERING AND WATER CONTROL EQUIPMENT

A. Select equipment and materials necessary to achieve desired results for dewatering.

B. Use equipment that is in good repair and operating order.

C. Maintain sufficient standby equipment and materials available at the site to ensure continuous operation, where required.

2.03 GEOTEXTILE CONTAINMENT TUBES

A. Contractor may utilize a pervious geotextile containment tube for capturing and removing sediment from water collected during dewatering operations.

B. Tube Construction: Fabricated from woven, mono-filament or multi-filament pervious sheets of geotextile material and provided with filling ports and a pressure relief port.

C. Manufacturers: One of the following or equal:

1. Geocontainer, as manufactured by Ten Cate Nicolon.

2. Geotube, as manufactured by Texion Geosynthetics.

PART 3 - EXECUTION

3.01 NPDES PERMIT COMPLIANCE

A. Implement the Groundwater Control Plan as approved by the Oregon DEQ before beginning excavation.

B. Comply with all limitations and controls for water discharges, monitoring requirements and other special conditions specified in the permit.

3.02 MONITORING GROUNDWATER

A. Groundwater Monitoring Wells:

1. Install a minimum of three (3) groundwater monitoring wells for monitoring groundwater elevation upgradient and downgradient at each dewatering system location on the project site.

2. Measure and record groundwater elevation two times per week during the course of dewatering to lower the groundwater table.

3. When groundwater monitoring wells are no longer needed for monitoring ground water levels, abandon groundwater monitoring wells in accordance with Applicable laws and regulations.

B. Installation of Monitoring Devices

1. Construct well in accordance with the requirements of ASTM D5092, Standard Practice for Design and Installation of Groundwater Monitoring Wells.

2. Depth of Drilled Hole: Minimum 10 feet below required elevation of groundwater drawdown, or to the depth of bedrock.

3. Construction Methodology: Install monitoring wells using methods that do not use drilling mud.

3.03 DEWATERING

A. Perform dewatering in accordance with approved Shop Drawings. Keep the Owner's Representative advised of any changes made to accommodate field conditions and, on completion of the dewatering system installation, revise and resubmit Shop Drawings as necessary to indicate the installed configuration.

B. Organize dewatering operations to lower the groundwater level in excavations as required for prosecution of the Work, and to provide a stable, dry subgrade for the prosecution of construction operations.

C. Design, install and operate the dewatering systems so that fines are not removed from native subgrade and surrounding soils during dewatering.

D. Maintain water level at lower elevations, so that no danger to structures can occur because of buildup of excessive hydrostatic pressure, and provide for maintaining the water level below the subgrade, unless otherwise permitted by the Owner's Representative.

E. Maintain groundwater level a minimum of five feet below the prevailing level of backfill being placed.

F. Dispose of water in such a manner as to cause no injury or nuisance to public or private property, or be a menace to the public health. Dispose of the water in accordance with applicable regulatory agency requirements.

G. Dewatering of Pipe Trenches: Do not drain trench water through the pipeline under construction.

H. Maintain continuous dewatering operations so that the excavated areas are kept free from water during construction, while concrete is setting and achieves full strength, and until backfill has been placed to a sufficient height to anchor the work against possible flotation.

I. Prevent disposal of sediments to adjacent lands or waterways by employing necessary methods, including settling basins. Locate settling basins away from watercourses to prevent silt-bearing water from reaching the watercourse.

J. Where excavations may obstruct the natural flow of a watercourse, implement measures to control and dispose of the surface water that will not adversely affect water quality or beneficial uses of the watercourse. Divert watercourse flows around excavation areas by constructing barriers, temporary culverts, new channels or other appropriate means.

K. Do not allow water containing mud, silt or other pollutants from aggregate washing or other construction activities to enter a watercourse or be placed in locations that may be subjected to high storm flows.

3.04 SURFACE WATER CONTROL

A. Intercept surface water and divert it away from excavations through use of dikes, ditches, curb walls, pipes, sumps or other means. This requirement extends to temporary works required to protect adjoining properties from surface drainage caused by construction operations.

B. Implement the appropriate level of surface water control to protect water quality throughout the construction period.

C. Utilize Best Management Practices throughout the construction period.

3.05 GROUNDWATER CONTROL

A. Provide labor, material, equipment, techniques and methods to lower, control and handle groundwater in a manner compatible with construction methods and site conditions. Monitor effectiveness of the installed system and its effect on adjacent property.

B. Intercept water flowing into excavations and divert it to sumps or ditches to allow pumping of collected water out of the excavation.

C. Provide settling basins, geotextile containment devices or other sediment removal and water treatment devices for water quality control and compliance with regulatory and permit requirements.

1. Install geotextile containment devices in accordance with the manufacturer's instructions and requirements.

D. Operate and maintain groundwater control systems in accordance with the Groundwater Control Plan. Notify Engineer in writing of any changes made to accommodate field conditions and changes to the Work.

E. Provide for continuous system operation, including nights, weekends, and holidays. When deemed appropriate, provide backup power source for electrical service.

F. Monitor operations to verify that the system lowers groundwater levels at a rate required to maintain a dry excavation resulting in a stable subgrade for prosecution of subsequent operations.

G. Remove all groundwater control systems upon completion of construction or when dewatering and control of surface or groundwater is no longer required. Remove and grout piezometers when groundwater control operations are complete.

3.06 WELL ABANDONMENT

A. Abandon wells using a licensed water well contractor in accordance with OAR 690-220.

B. Include well abandonment costs, including permits and documentation, in the Lump Sum Price.

3.07 RECORDS

A. Provide a daily record of the average flow rate. Provide results of water quality testing as required by the Permit for discharge.

B. Observe and record the elevation of the groundwater during the period that the dewatering system is in operation.

END OF SECTION

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SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Temporary excavation support systems.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 31 00 00 – Earthwork

1.03 DEFINITIONS

A. Protection Systems:

1. Sloping or benching systems for excavated slopes.
2. Structural support systems, shield systems, and other systems for preventing excavation wall failure.

1.04 SUBMITTALS

A. Prepare and submit in accordance with Section 01 33 00.

B. Submit information as a complete package. Include all items required by the Contract Documents. Incomplete submittals will not be reviewed and will be returned for resubmittal as a complete package.

C. Shop Drawings

1. Prepared, signed, and sealed by a professional engineer who is registered to practice in the state of Oregon.
2. Clearly indicate structural sections of shoring members, welding details, bolting details, and bracing details.
3. Indicate existing and new structures, pipelines and other improvements located in the vicinity and impacting the design of the shoring system.
4. Provide details for bracing, reinforcement and sealing around penetrations.

D. Calculations: Structural calculations verifying and demonstrating the structural safety and adequacy of the sheeting, shoring, and bracing to be used.

1. Prepared, signed, and sealed by a registered Professional Civil or Structural Engineer who is registered to practice in the State of Oregon.
2. Provide calculations for the different load, support and other conditions that occur during the sequence of installation, construction of facilities protected by the shoring and the sequence of removal of the internal bracing and shoring.

E. Sheet Pile Driving Equipment: Information on type of equipment to be used, including manufacturer, model number and driving energy.

F. Qualifications of registered Professional Engineer and shoring installer, including project references.

G. Prepare a detailed plan illustrating the sequence of installation and removal of shoring systems and internal bracing. Include sketches showing the various stages in the sequence.

H. Letter confirming installation of the shoring system is in accordance with the shoring design.

I. Control Points and Stability Measurements:

1. Submit proposed location and details of control points and method and schedule for obtaining stability measurements.

2. Submit field notes documenting stability measurements.

1.05 INSTALLER QUALIFICATIONS

A. Shoring installer must have a minimum of five successful past installations of shoring systems of comparable overall heights and comparable penetration of soils similar to those found on the project site.

1.06 PERFORMANCE REQUIREMENTS

A. Design and install excavation support and protection systems that are capable of:

1. Supporting excavation sidewalls and bottom to maintain the required excavation or trench section.

2. Resisting soil and hydrostatic pressure and superimposed construction loads and other live loads.

3. Protecting existing facilities in the vicinity of the excavation from damage due to settlement or movement of soil

B. Provide professional engineering services necessary to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified professional engineer registered in the State of Oregon.

C. Install and remove excavation support and protection systems without damaging existing buildings, pavements, utilities, railroad facilities and other improvements adjacent to excavation.

D. Excavations

1. Protect workers from hazard of caving ground and other hazards.

2. Install excavation protection system in locations where:

a. Protection system is specifically indicated on the Drawings.

b. Excavations are equal to, or greater than, 5 feet deep.

c. Excavations are less than 5 feet deep, but there is a potential for cave-in.

d. When engineering analyses prepared by the Contractor indicate the stability of existing structures and facilities may be jeopardized by settlement or movement of soil.

1.07 GENERAL DESIGN REQUIREMENTS

A. Design excavation support systems to meet requirements and standards of the Occupational Safety and Health Administration (OSHA).

B. Design excavation support systems to meet the requirements of Oregon Administrative Rules, Chapter 437, Division 3, Subdivision P.

C. Design structural steel members in accordance with the American Institute of Steel Construction (AISC) Manual of Steel Construction Allowable Stress Design and the Uniform Building Code.

D. Excavation support systems for trench excavations shall be selected by the Contractor based on the soil and rock conditions, depths of trench excavations, groundwater conditions and other site conditions. No attempt has been made by Engineer to define acceptable trench shoring options.

E. Excavation support systems for structural excavations may consist of either driven steel sheet piling or drilled and/or driven soldier beam and lagging systems complying with requirements of this Section. Contractor may select from either specified system.

F. Allowable Deflection: Not more than 1/2-inch at any point on the shoring system.

G. Cantilevered Design Limits:

1. Maximum height of cantilevered shoring above the bottom of the excavation shall not exceed 15 feet.

H. Resistance to Overturning

1. Design soldier piles and sheet piles with sufficient depth below the excavation to:

a. Resist lateral movement or overturning of the pile, and

b. Act as an effective water cutoff to prevent heaving or flow of soil into the excavation.

2. Calculate the required depth of pile below the bottom of the excavation by assuming the soil immediately below the bottom of excavation does not provide passive resistance for a depth of 1.5 times the effective pile diameter.

1.08 DESIGN REQUIREMENTS FOR SOLDIER PILES AND LAGGING

A. Design soldier piles for downward loads including vertical loads from tie back anchors.

B. Flexural Strength of Lagging: In accordance with the Uniform Building Code, but not greater than 1,500 psi.

C. Wales: Use back-to-back structural members.

D. Soil Anchors, Rock Anchors and Deadmen Anchors:

1. Design tie back anchors with a safety factor of not less than 2 times the calculated load from the shoring.

2. When calculating the length of soil anchors needed to resist the load from the shoring, do not include any anchor length within the potential active pressure soil failure zone behind the face of the shoring.

3. Design anchor tie rods for 130 percent of the calculated load from the shoring.

4. When tie rod couplings are used, design anchor tie rods for 150 percent of the calculated load from the shoring.

1.09 GEOTECHNICAL DATA REPORT (GDR)

A. A geotechnical data report has been prepared for this Project and is included with specifications as a supplement for information only. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for design of the excavation support systems.

2. Copies of the GDR are bound separately and are included in the Contract Documents.

1.10 GEOTECHNICAL ENGINEERING REPORT

A. A Geotechnical Engineering Report has also been prepared and it is available if requested. The geotechnical engineering report is not considered part of the Contract Documents.

1.11 PROJECT SPECIFIC DESIGN REQUIREMENTS

A. Design of Excavation Support System

1. Design Groundwater Elevation: Two feet below ground surface elevation.

2. For excavations extending into basalt bedrock the rock can be cut at slopes as steep as vertical.

3. Specialized drilling equipment may be required to pre-drill holes for soldier pile installation within bedrock.

4. Excavation support systems may be required to protect utilities and provide space for access to the site.

1.12 JOB SITE POSTINGS

A. Maintain at least one copy of the protection system design at the job site while the excavation is open in accordance with the requirements of Oregon Administrative Rules, Chapter 437, Division 3, Subdivision P.

1.13 SEQUENCE AND SCHEDULING

A. Do not begin excavations or installation of excavation supports until submittals for excavation support systems have been accepted by the Engineer and until materials necessary for installation are on site.

B. Allow a minimum of 30 calendar days for Engineer's review of submittals for excavation support systems.

C. Do not begin excavations or installation of excavation support systems until initial survey measurements on control points on existing structures and other improvements are obtained to document baseline elevations and locations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel Soldier Beams: ASTM A36, ASTM A690 or ASTM A992.

C. Steel Sheet Piling: ASTM A328, ASTM A572 or ASTM A690; with continuous interlocks.

D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness as determined by design calculations, but not less than 3 inches.

E. Lean Concrete Mix:

1. Controlled Low Strength Material.

2. A mixture of sand, fine aggregate, water and 2 sacks of cement per cubic yard to create a flowable mixture that fills voids.

3. Minimum Compressive Strength: 1500 psi.

F. Sand Cement Grout:

1. Mixture of one part cement, two parts sand, proportioned by volume, admixtures for pressure grouting, and sufficient water to form workable mix.

2. Maximum slump: 4 inches.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prior to beginning installation of the excavation support system, pothole to locate existing buried utilities in the vicinity of the excavation. Survey utilities and compare actual locations to those locations indicated on the Drawings and the Shop Drawings. Determine any areas of conflict and revise the design and layout of the excavation support system to eliminate these conflicts.

3.02 SLOPING AND BENCHING OF EXCAVATED FACES

A. Where structural excavation support systems are not specifically indicated on the Drawings, sloping and benching systems for exposed faces of excavations may be utilized.

B. Construct sloping and benching systems in accordance with Section 31 00 00.

3.03 TRENCHING SUPPORT SYSTEMS

A. Where structural excavation support systems are not specifically indicated on the Drawings, trench support systems consisting of hydraulic jacks and plates, trench shield systems, and other trench protection systems may be utilized.

3.04 SOLDIER BEAMS AND LAGGING

A. Before starting excavation, drive steel soldier beams or install steel soldier beams in pre-drilled holes.

1. Installation of Soldier Beams in Pre-Drilled Holes

a. Diameter of pre-drilled hole: Not to exceed the outside dimensions of the soldier beam.

b. Backfill around soldier beam using a lean concrete mix.

B. Space soldier beams at regular intervals not to exceed allowable flexural strength of the wood lagging. Align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

C. Install wood lagging within flanges of soldier beams as excavation proceeds. Trim excavation as required to install lagging.

D. Install horizontal wales at locations indicated on the shop drawings and secure to soldier beams.

E. Fill voids behind lagging with gravel, lean concrete, or other material acceptable to the Engineer.

3.05 SHEET PILING

A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

3.06 BRACING

A. Locate bracing to clear temporary and permanent work and to allow lowering of material and equipment into the excavation.

B. If necessary to move brace, install new bracing before removing original brace.

C. Install internal bracing when calculations indicate bracing is required to prevent spreading or distortion of braced frames.

D. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.07 INSPECTION

A. Designer of the shoring system is responsible for confirming proper installation of the shoring system. Shoring system designer, or a representative of the designer, shall make site visits to confirm installation is in accordance with the accepted shoring design.

B. Submit letter of proper installation confirming installation is in accordance with the shoring design.

C. Remove at least the top 10 feet of excavation support systems.

D. Remove excavation support and protection systems when backfill can support the remaining open excavation and bear soil and hydrostatic pressures. Remove support and protection systems in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

E. After removal, promptly fill voids resulting from the extraction of shoring with sand-cement grout. Repair or replace adjacent work damaged or displaced by excavation support and protection systems removal.

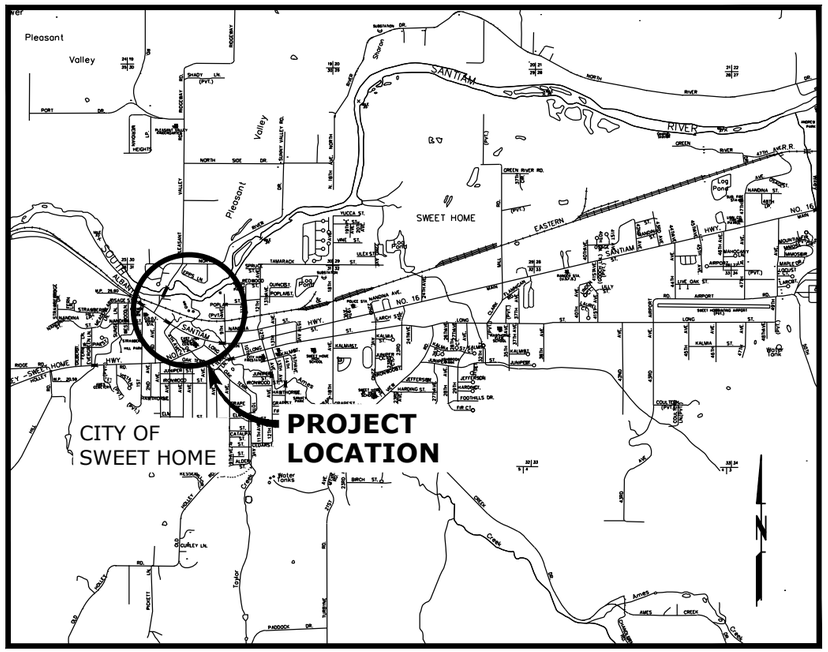
END OF SECTION

Exhibit A

Drawings

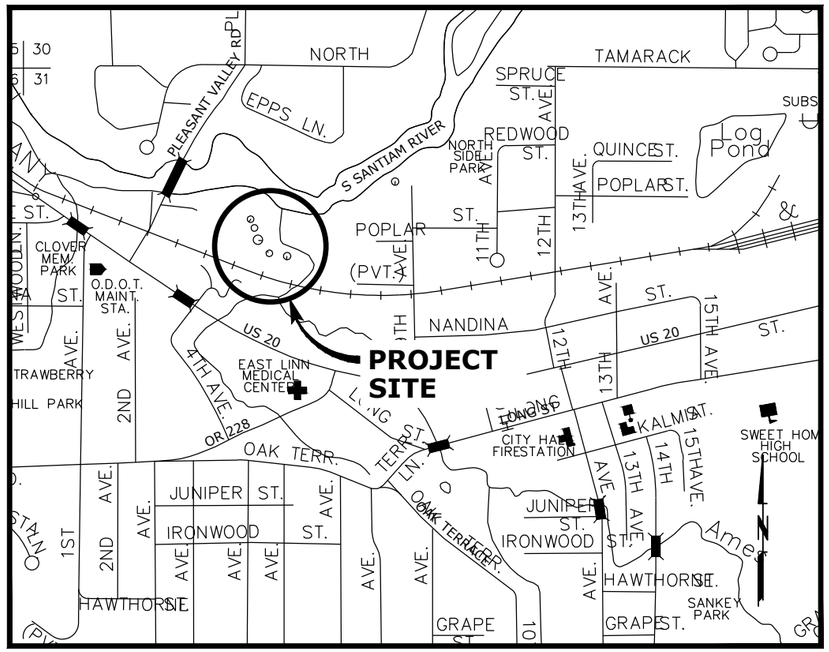
MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN BUILD

DECEMBER 2022



VICINITY MAP

SCALE: 1"=2000'



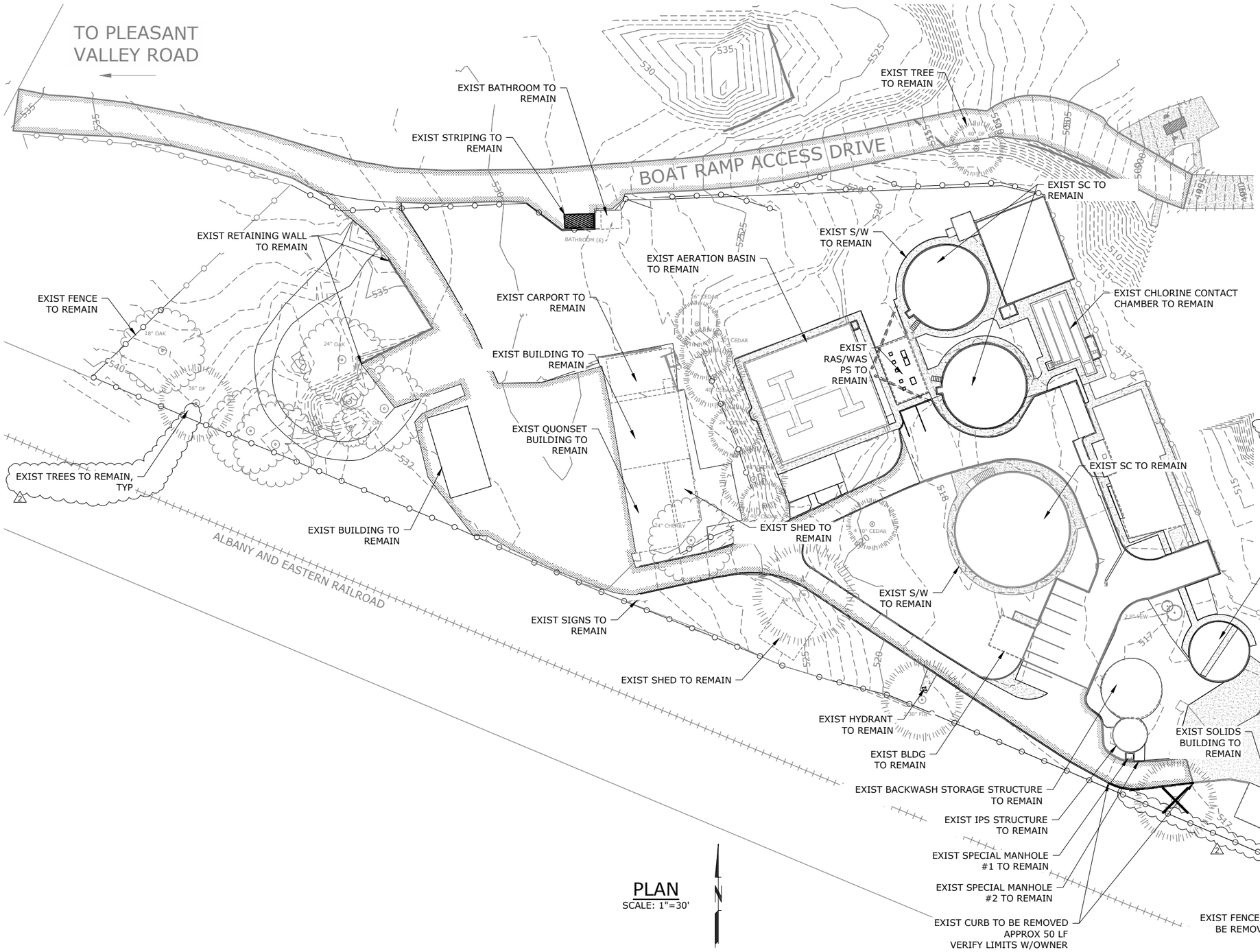
LOCATION MAP

SCALE: 1"=500'

WEST YOST
Water. Engineered.

ATTENTION: OREGON LAW REQUIRES THE CONTRACTOR TO FOLLOW THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. THE CONTRACTOR MAY OBTAIN COPIES OF THE RULES BY CALLING THE UTILITY NOTIFICATION CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-246-6699.)

P:\Clients\936 City of Sweet Home\50-21-09 WWTP Phase 1 Final Design\CAD\Production\Sludge Blend Tank DB\19-2605-OR-G-SBT-DB.dwg G-000 12/15/2022 4:20 PM BBARRY 24.1s (LMS Tech)



PLAN
SCALE: 1"=30'

DEMOLITION LEGEND

- FENCE/SIGN DEMOLITION
- PAVEMENT AND CURB DEMOLITION
- BUILDING AND TANK DEMOLITION
- CONCRETE FLATWORK DEMOLITION
- TREE REMOVAL

SITE DEMOLITION NOTES:

1. CONTRACTOR SHALL PROTECT ALL EXISTING SURFACES, PIPES, VALVES, EQUIPMENT, AND OTHER ITEMS NOT IDENTIFIED TO BE DEMOLISHED.
2. DEMOLITION, ABANDONMENT, SALVAGE, AND DISPOSAL OF EXISTING EQUIPMENT SHALL BE PERFORMED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
3. SALVAGED EQUIPMENT DELIVERY POINT SHALL BE AT A LOCATION DESIGNATED BY THE CITY.
4. CONTRACTOR SHALL REPAIR AT CONTRACTOR'S EXPENSE ANY EXISTING STRUCTURES THAT WERE CALLED OUT TO REMAIN DAMAGED DURING CONSTRUCTION.
5. STRUCTURES SHALL BE REMOVED IN FULL INCLUDING ALL WALLS, FOOTINGS, SLABS, INCLUDING ANY PART OF THE STRUCTURE THAT IS BELOW GRADE UNLESS OTHERWISE NOTED.
6. MAINTAIN ACCESS TO THE EXISTING BOAT RAMP NORTH OF THE MWRF SITE AT ALL TIMES DURING CONSTRUCTION.
7. QUANTITY SHOWN IS APPROXIMATE. CONTRACTOR TO VERIFY. (2)
8. CONTRACTOR TO DISPOSE OF SOLIDIFIED LIME FROM THE LIME SILO AT AN APPROVED ENVIRONMENTAL LANDFILL. QUANTITY OF LIME IN THE LIME SILO IS UNKNOWN.
9. CONTRACTOR TO SALVAGE ECO-BLOCKS FROM THE BIOFILTER. SEE NOTE 3.

NO.	DATE	BY	REVISION
1	01/09/2023	BVB	ADDENDUM 3
2	01/18/2023	BVB	ADDENDUM 4

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

BVB DESIGNED
BVB DRAWN
WJM CHECKED

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MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

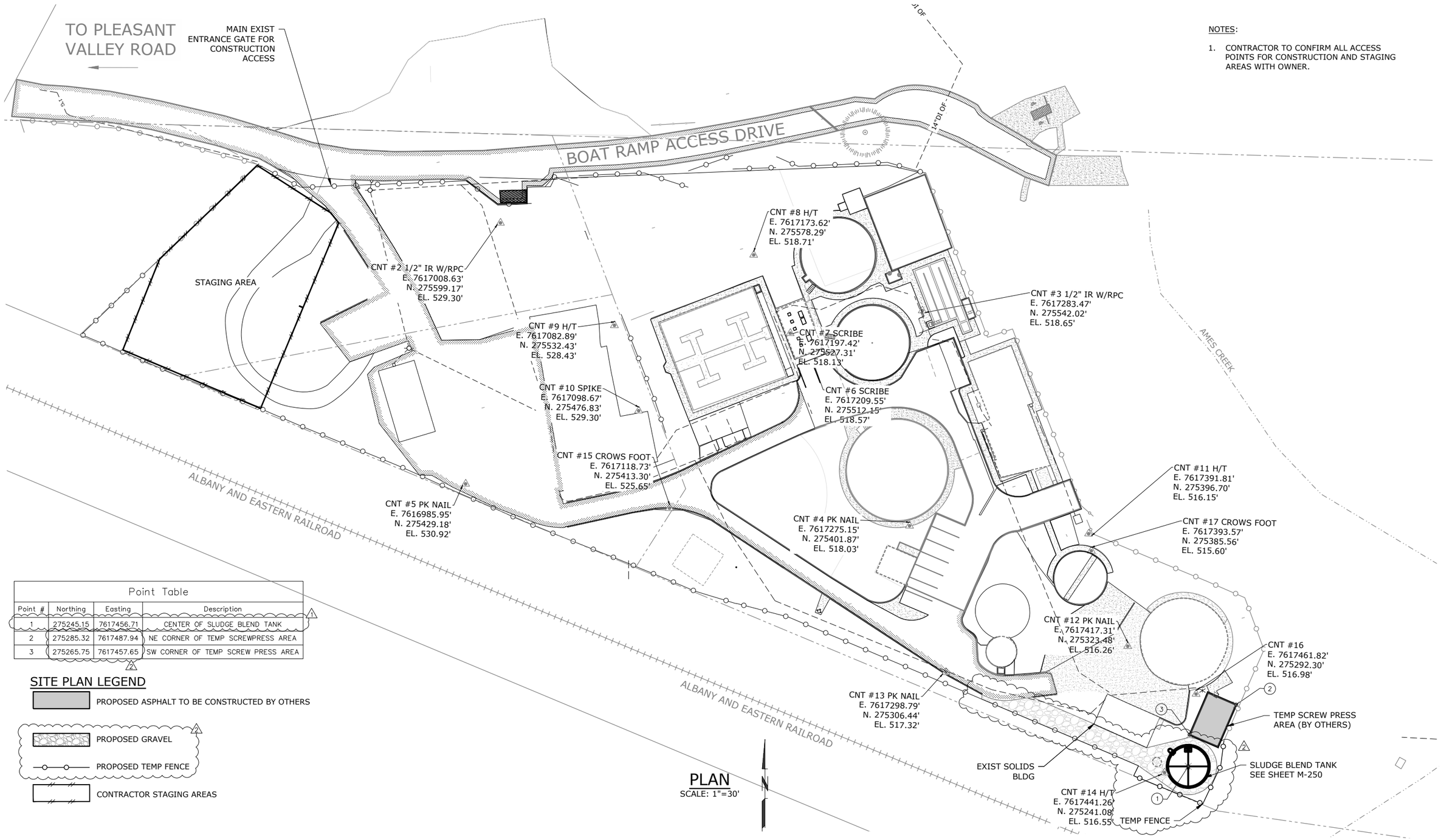
SITE DEMOLITION & TREE REMOVAL PLAN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
C-005
XX of XX

P:\Clients\936 City Of Sweet Home\50-21-09 WWTP Phase 1 Final Design\CAD\Production\Sludge Blend Tank DB\19-2605-OR-C-SBT-DEMO.dwg C-005 1/17/2023 2:33 PM BBARRY 24.1s (LMS Tech)

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NOTES:

1. CONTRACTOR TO CONFIRM ALL ACCESS POINTS FOR CONSTRUCTION AND STAGING AREAS WITH OWNER.

Point Table			
Point #	Northing	Easting	Description
1	275245.15	7617456.71	CENTER OF SLUDGE BLEND TANK
2	275285.32	7617487.94	NE CORNER OF TEMP SCREWPRESS AREA
3	275265.75	7617457.65	SW CORNER OF TEMP SCREW PRESS AREA

SITE PLAN LEGEND

- PROPOSED ASPHALT TO BE CONSTRUCTED BY OTHERS
- PROPOSED GRAVEL
- PROPOSED TEMP FENCE
- CONTRACTOR STAGING AREAS

PLAN

SCALE: 1"=30'

NO.	DATE	BY	REVISION
1	01/09/2023	BVB	ADDENDUM 3
2	01/18/2023	BVB	ADDENDUM 4

NOTICE
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BVB DRAWN
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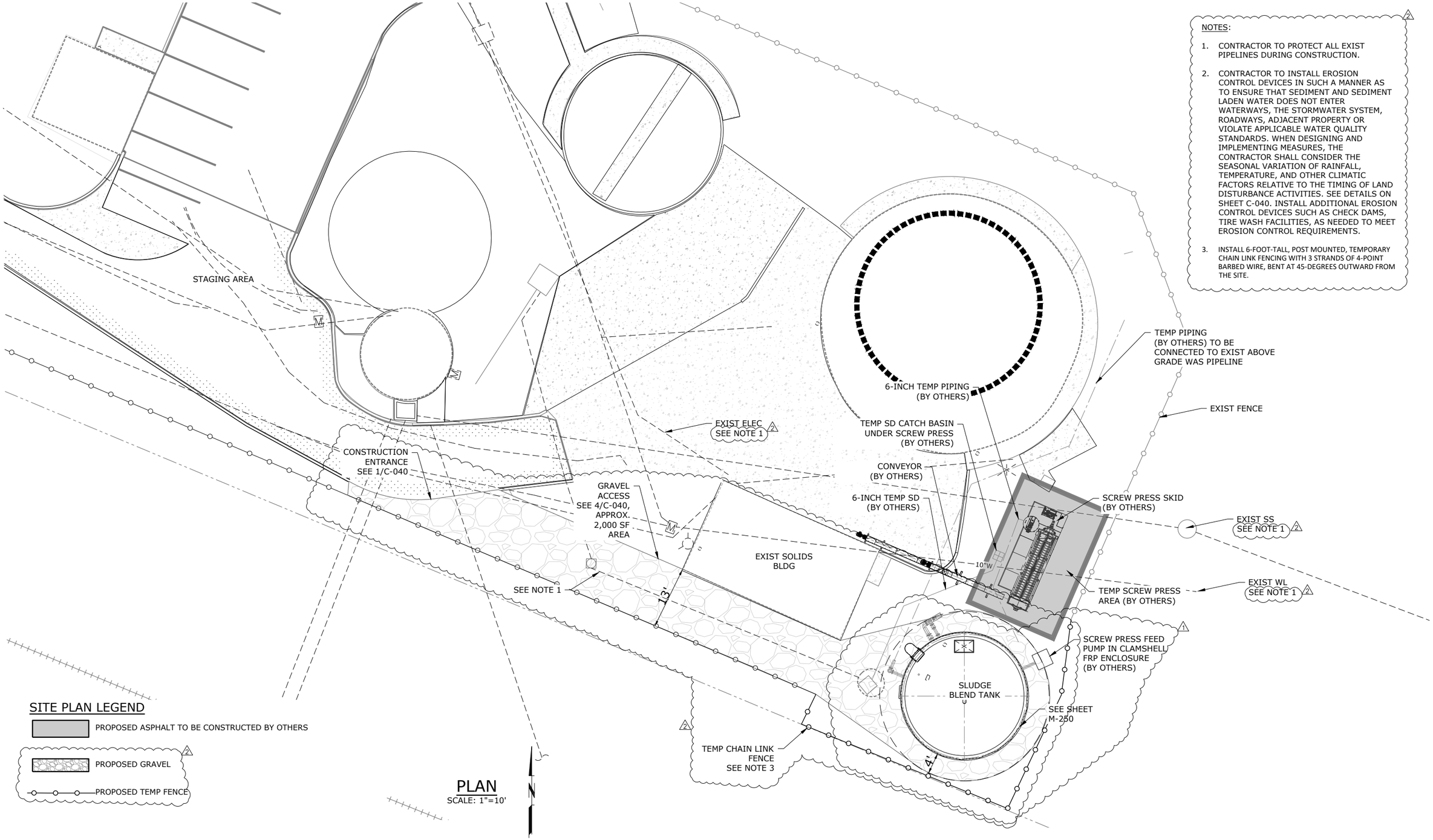
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MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

OVERALL SITE PLAN, STRUCTURE COORDINATES, STAGING AND ACCESS, SURVEY CONTROL POINTS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
C-010
XX of XX



NOTES:

1. CONTRACTOR TO PROTECT ALL EXIST PIPELINES DURING CONSTRUCTION.
2. CONTRACTOR TO INSTALL EROSION CONTROL DEVICES IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT ENTER WATERWAYS, THE STORMWATER SYSTEM, ROADWAYS, ADJACENT PROPERTY OR VIOLATE APPLICABLE WATER QUALITY STANDARDS. WHEN DESIGNING AND IMPLEMENTING MEASURES, THE CONTRACTOR SHALL CONSIDER THE SEASONAL VARIATION OF RAINFALL, TEMPERATURE, AND OTHER CLIMATIC FACTORS RELATIVE TO THE TIMING OF LAND DISTURBANCE ACTIVITIES. SEE DETAILS ON SHEET C-040. INSTALL ADDITIONAL EROSION CONTROL DEVICES SUCH AS CHECK DAMS, TIRE WASH FACILITIES, AS NEEDED TO MEET EROSION CONTROL REQUIREMENTS.
3. INSTALL 6-FOOT-TALL, POST MOUNTED, TEMPORARY CHAIN LINK FENCING WITH 3 STRANDS OF 4-POINT BARBED WIRE, BENT AT 45-DEGREES OUTWARD FROM THE SITE.

SITE PLAN LEGEND

- PROPOSED ASPHALT TO BE CONSTRUCTED BY OTHERS
- PROPOSED GRAVEL
- PROPOSED TEMP FENCE

PLAN
SCALE: 1"=10'

NO.	DATE	BY	REVISION
1	01/09/2023	BVB	ADDENDUM 3
2	01/18/2023	BVB	ADDENDUM 4

NOTICE
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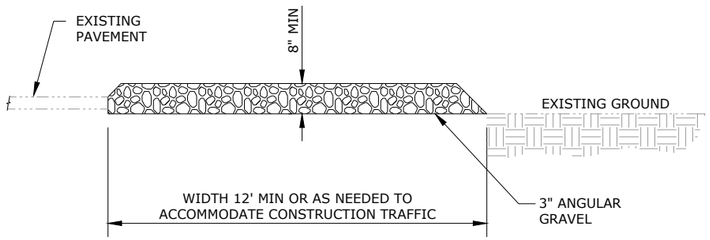
MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

SOLIDS AREA DETAIL PLAN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
C-020
3 of XX

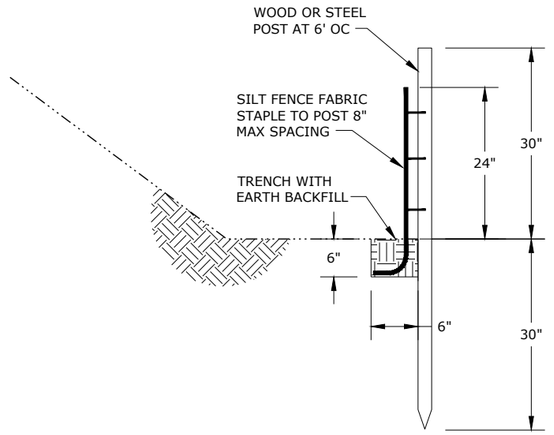
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STABILIZED CONSTRUCTION ENTRANCE

SCALE: NTS

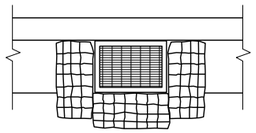
1
-



SILT FENCE

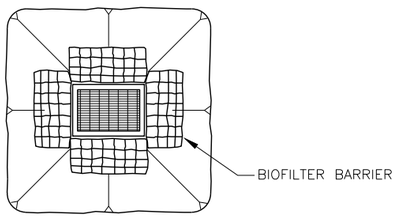
SCALE: NTS

2
-



CURB INLET

NOTES:
1. REMOVE SEDIMENT FROM BEHIND BIOBAGS WHEN IT REACHES 2 INCHES IN DEPTH.
2. INSTALL INLET INSERT SEE 5 -

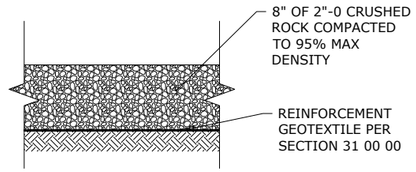


DRAIN INLET

INLET PROTECTION

SCALE: NTS

3
-



GRAVEL SECTION

SCALE: NTS

4
-

NO.	DATE	BY	REVISION
1	01/18/2023	BVB	ADDENDUM 4

NOTICE
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BVB DESIGNED
BVB DRAWN
WJM CHECKED

REGISTERED PROFESSIONAL ENGINEER
85993PE
OREGON
JULY 14, 2017
BROOKE VICTORIA BARRY
EXPIRES : 12/31/2023

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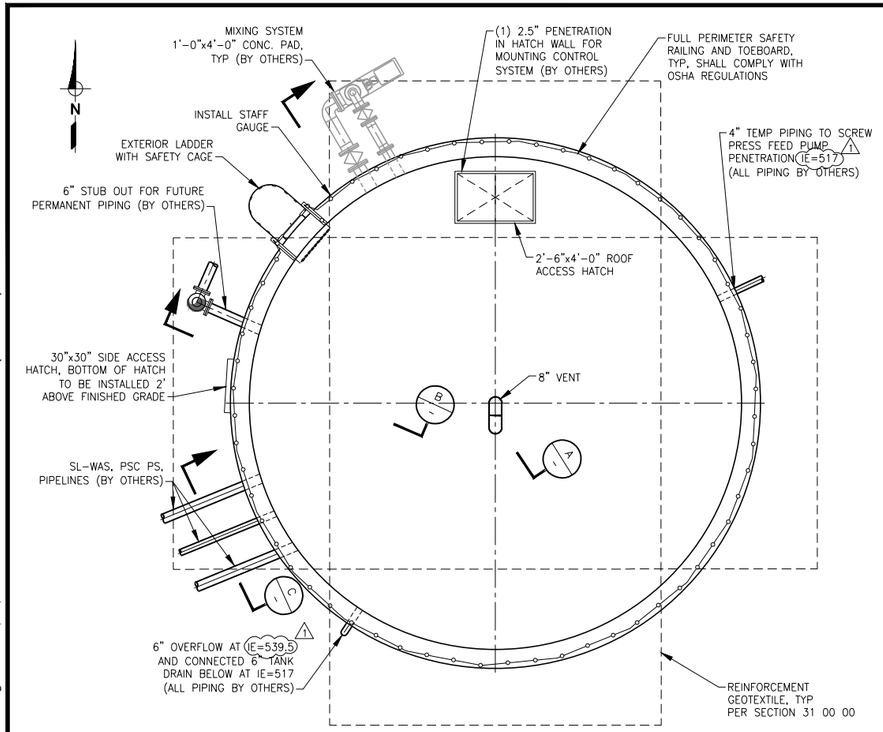
MAHLER WATER
RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

EROSION CONTROL & CIVIL
DETAILS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
C-040
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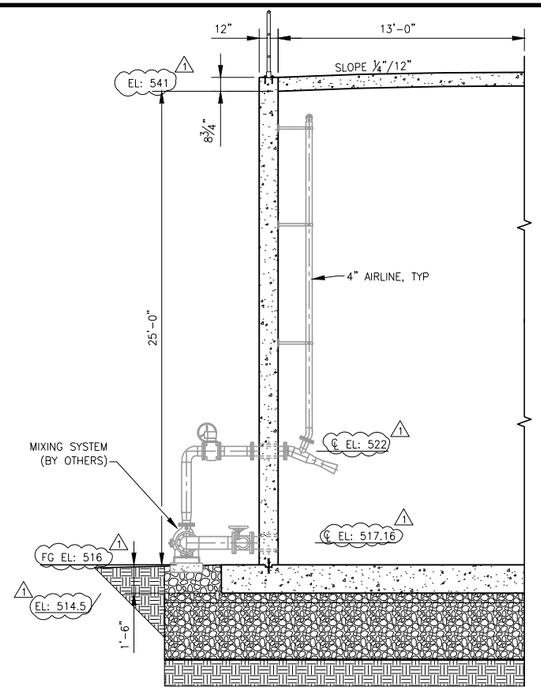
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SLUDGE BLEND TANK

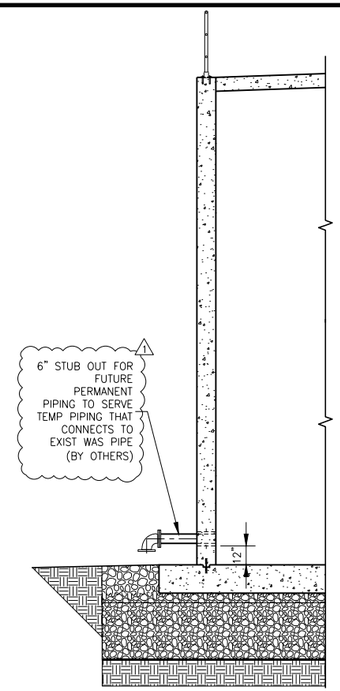
PLAN

SCALE: 1/4"=1'-0"



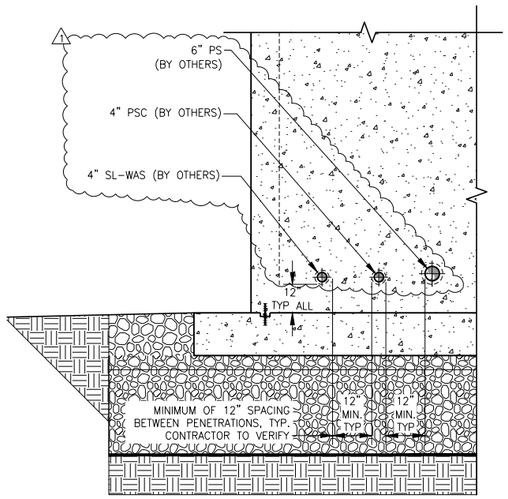
SECTION A

SCALE: 1/4"=1'-0"



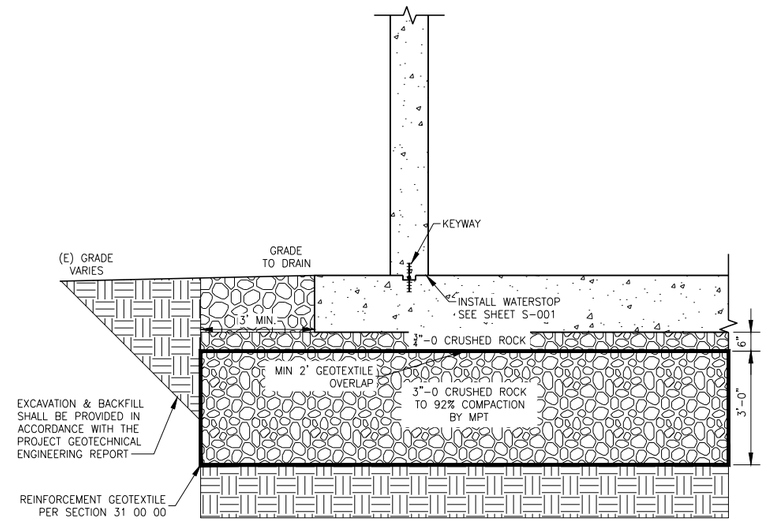
SECTION B

SCALE: 1/4"=1'-0"



SECTION C

SCALE: 3/8"=1'-0"



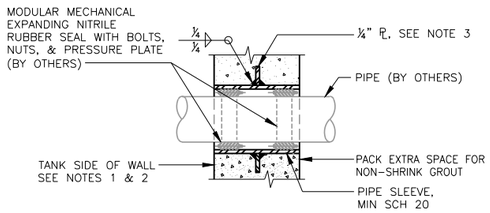
FOUNDATION SURFACE PREPARED TO THE SATISFACTION OF THE PROJECT GEOTECHNICAL ENGINEER.

CONTRACTOR SHALL CONFORM WITH GEOTECHNICAL REPORT

TYPICAL BURIED TANK SECTION

DETAIL 1

NOT TO SCALE



TANK WALL PIPE PENETRATION (DOUBLE LINK SEAL)

DETAIL 2 TYP

NOT TO SCALE

NOTES:
1. SLEEVE DIAMETER SHALL BE AS RECOMMENDED BY THE MECHANICAL SEAL MANUFACTURER.
2. SLEEVE NOT REQUIRED FOR PENETRATION IN EXISTING WALLS.
3. WEEP RINGS SHALL HAVE A MINIMUM DIAMETER EQUAL TO THE PIPE OR PIPE SLEEVE OUTSIDE DIAMETER PLUS 3-INCHES.
4. "TANK SIDE OF WALL" SHALL MEAN SIDE OF WALL NORMALLY EXPOSED TO LIQUID, EARTH, OR OUTSIDE ATMOSPHERE.
5. SEAL WITH MASTIC SEALANT WHERE WALL IS EXPOSED TO LIQUID, EARTH, OR EXPLOSION HAZARD AREA.

NO.	DATE	BY	REVISION
1	01/13/2023	BVB	ADDENDUM 3

NOTICE
0 ½ 1
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EMR DESIGNED
SMB DRAWN
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MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

SLUDGE BLEND TANK AND MIXING SYSTEM
PLAN, SECTIONS AND DETAILS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
M-250
XX of XX

P:\Clients\936 City Of Sweet Home\50-21-09 WWTP Phase 1 Final Design\CAD\Production\Sludge Blend Tank DB\93650-2109-M-250.dwg M-250 1/12/2023 9:19 AM ERODRIGUEZ 23.1s (LMS Tech)

SPECIAL INSPECTIONS:

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD
OSSC TABLE 1705.6, SOILS:			
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.		X	
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.		X	
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.		X	
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X		
5. PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.		X	
OSSC TABLE 1705.3, CONCRETE CONSTRUCTION:			
1. INSPECT REINFORCEMENT AND VERIFY PLACEMENT.		X	OSSC 1908.4
2. REINFORCING BAR WELDING: A. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706. B. INSPECT SINGLE PASS FILLET WELDS, MAXIMUM 5/16". C. INSPECT ALL OTHER WELDS.	 X	 X X	
3. INSPECT ANCHORS CAST IN CONCRETE.		X	
4. INSPECT ANCHORS POST INSTALLED IN HARDENED CONCRETE MEMBERS. A. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS. B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.A.	 X	 X	
5. VERIFY USE OF REQUIRED MIX DESIGN.		X	OSSC 1904.1, 1904.2 1908.2, 1908.3
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS AND DETERMINE THE TEMPERATURE OF THE CONCRETE. COLLECT A MINIMUM OF 6 TEST CYLINDERS FOR EACH POUR ON EACH DAY & EVERY 50 CY POURED.	X		OSSC 1908.10
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X		OSSC 1908.6, 1908.7 1908.8
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.		X	OSSC 1908.9
9. INSPECT PRESTRESSED CONCRETE FOR: A. APPLICATION OF PRESTRESSING FORCES. B. GROUTING OF BONDED PRESTRESSING TENDONS.	 X X		
10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.		X	
11. VERIFY IN-SITU CONCRETE STRENGTH PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.		X	
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.		X	

NOTE: SPECIAL INSPECTION SHALL BE PROVIDED FOR ALL STRUCTURAL ELEMENTS REQUIRING SPECIAL INSPECTION REGARDLESS OF WHETHER THE WORK IS PERFORMED ONSITE OR OFFSITE (SHOP).

CONTRACTOR RESPONSIBILITIES

CONTRACTOR RESPONSIBILITIES: THE CONTRACTOR IS RESPONSIBLE FOR CARRYING OUT THE REQUIREMENTS OF THESE DOCUMENTS THROUGH THE USE OF THEIR OWN EFFORTS OR THAT OF SUB-CONTRACTORS.

THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION METHODS, TECHNIQUES, SEQUENCING AND SAFETY REQUIRED TO COMPLETE THE WORK. ALL INSTRUCTIONS CONTAINED IN THESE DOCUMENTS ARE INTERPRETED TO BE INSTRUCTIONS TO THE CONTRACTOR AND ARE THE RESPONSIBILITY OF THE CONTRACTOR TO FULFIL.

VERIFY EXISTING CONDITIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. IMMEDIATELY BRING DISCREPANCIES TO THE ATTENTION OF THE ENGINEER OF RECORD (EOR).

MEASURE DIMENSIONS OF ANY EXISTING STRUCTURES ASSOCIATED WITH THE WORK AND COORDINATE WITH REQUIRED DIMENSIONS FOR NEW CONSTRUCTION. DRAWINGS SCALES ARE INDICATED FOR REFERENCE TO ASSIST WITH CLARIFYING THE WORK AND PROVIDING PROPORTIONS THAT RESEMBLE ACTUAL CONDITIONS. DO NOT MEASURE DRAWINGS FOR CONSTRUCTION. USE TEXT DIMENSIONS PROVIDED. REQUEST UNKNOWN DIMENSIONS FROM THE ENGINEER WITH SUFFICIENT LEAD TIME TO PREVENT CONSTRUCTION DELAYS. FIELD VERIFY DIMENSIONS.

ARRANGE FOR AND COORDINATE WORK BY TRADES AND SUPPLIERS. FACILITATE REQUIRED INSPECTIONS, SPECIAL INSPECTIONS AND TESTS SPECIFIED BY THE CONTRACT DOCUMENTS, BUILDING CODE AND PERMIT. WHERE COVERINGS OR WORK CONCEALS ITEMS OR AREAS TO BE INSPECTED PRIOR TO SATISFACTORY APPROVAL THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF COVERINGS OR WORK AS NECESSARY WITHOUT COST TO THE OWNER OR ENGINEER OF RECORD.

THE STRUCTURES SHALL BE FULLY BRACED FOR WIND AND SEISMIC LOADS DURING CONSTRUCTION. THE CONTRACTOR SHALL BRACE THE WORK UNTIL THE PERMANENT LATERAL FORCE RESISTING SYSTEM IS COMPLETED.

INSTALL ITEMS MANUFACTURED OR SUPPLIED BY OTHERS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

WHERE DETAILS OF CONSTRUCTION ARE NOT EXPLICITLY SHOWN, PROVIDE MATERIALS AND CONSTRUCTION OF THE SAME TYPE AND CHARACTER AS THAT OF SIMILAR CONDITIONS USED ON THE PROJECT. THE ACTUAL DETAILS USED SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING MATERIALS OR BEGINNING CONSTRUCTION.

ANY CONFLICT OR DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD FOR CLARIFICATION AND RESOLUTION PRIOR TO ORDERING MATERIALS OR BEGINNING CONSTRUCTION.

STRUCTURAL MATERIAL NOTES

CONCRETE: ALL CONCRETE TANKS, BASINS, AND CONTAINMENT STRUCTURES ARE WATER-BEARING. WATER-BEARING CONCRETE STRUCTURES, INCLUDING REINFORCING, SHALL COMPLY WITH ACI 350, CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES AS WELL AS ACI 318 AND ACI 301 CURRENT EDITIONS. ALL OTHER CONCRETE CONSTRUCTION, INCLUDING REINFORCING, SHALL COMPLY WITH ACI 350, ACI 318 AND ACI 301 CURRENT GOVERNING EDITIONS.

CONCRETE SHALL BE READY MIXED IN ACCORDANCE WITH ASTM C94.

CONCRETE STRENGTHS SHALL BE VERIFIED BY STANDARD 28-DAY CYLINDER TESTS PER ASTM C39, AND SHALL BE AS FOLLOWS:

f'c	MAX W/C	MIN CEMENT	SLUMP	USE
4500 PSI	0.48	590 LBS	4"+/-1"	WATER BEARING STRUCTURES

MIX DESIGNS FOR WATER BEARING STRUCTURES SHALL INCLUDE A CRYSTALLINE WATERPROOFING ADMIXTURE.

CEMENT SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR PORTLAND CEMENT AND CONFORM TO ASTM C150, TYPE II.
FLY ASH CONFORMING TO ASTM C618, TYPE F OR TYPE C. SHALL BE USED TO REPLACE AT LEAST 10% AND UP TO 50% OF THE CEMENT CONTENT, PROVIDED THAT THE MIX STRENGTH IS SUBSTANTIATED BY TEST DATA.
COARSE AGGREGATE SHALL CONFORM TO ASTM C33 WITH A MAXIMUM SIZE OF 3/4".
FINE AGGREGATE SHALL BE CLEAN, DURABLE, NATURAL SAND CONFORMING TO ASTM C33.

A WATER-REDUCING ADMIXTURE CONFORMING TO ASTM C494, USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, SHALL BE INCORPORATED IN CONCRETE DESIGN MIXES. A HIGH-RANGE WATER-REDUCING ADMIXTURE CONFORMING TO ASTM C494, TYPE F OR G, MAY BE USED IN CONCRETE MIXES, PROVIDING THAT THE SLUMP DOES NOT EXCEED 8".
SLUMP AT POINT OF TRUCK DISCHARGE SHALL NOT EXCEED THAT INDICATED ABOVE. SUPERPLASTICIZED CONCRETE SLUMP SHALL NOT EXCEED 7" ±1".

AN AIR ENTRAINING ADMIXTURE CONFORMING TO THE LATEST REVISION OF ASTM C260 SHALL BE ADDED TO CONCRETE TO PROVIDE 4% ±1.5% ENTRAINED AIR FOR SLABS, WALKS AND CURBS EXPOSED TO WEATHER.

LOCATION OF ALL CONSTRUCTION, CONTRACTION, AND EXPANSION JOINTS SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER. PLACE CONSTRUCTION JOINTS IN SLABS AND BEAMS AT THE SAME TIME AND LOCATION. CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED AND INTENTIONALLY ROUGHENED FOR BOND. PROVIDE WATER STOPS IN ALL CONSTRUCTION JOINTS IN WATER BEARING SLABS AND WALLS.

EMBEDDED ITEMS SHALL BE FIRMLY HELD INTO POSITION IN THE FORMWORK AND SHALL NOT BE "WET STABBED" INTO FRESHLY PLACED CONCRETE OR GROUT.

EXPANSION JOINTS SHALL HAVE EDGES ROUNDED TO 1/4" RADIUS, USE 1/2" CORK OR CANE-FIBER FORM BOARD, EXCAVATED TO 1/2" DEPTH AND FILLED WITH AN APPROVED POLY-SULFIDE CAULK.

DO NOT PLACE ANY CONCRETE WHOSE TEMPERATURE IS ABOVE 90°F.

DO NOT PLACE ANY CONCRETE THAT IS MORE THAN 90 MINUTES OLD, SINCE BATCH TIME.

UNLESS SELF-CONSOLIDATING CONCRETE IS APPROVED AS SUCH, ALL CONCRETE SHALL BE CONSOLIDATED DURING PLACEMENT. CONSOLIDATION SHALL BE BY INTERNAL VIBRATION, USING A GASOLINE-POWERED OR PLUG-IN VIBRATOR. INSERT VIBRATOR VERTICALLY INTO THE CONCRETE AT A SPACING NOT EXCEEDING 1.5 TIMES THE RADIUS OF INFLUENCE. DO NOT USE VIBRATOR TO MOVE CONCRETE. EXCEPTIONS TO THE ABOVE MAY BE MADE AS FOLLOWS:
A) SLABS ON GRADE LESS THAN 8" THICK, MAY BE CONSOLIDATED BY TAMPING WITH A COMMERCIAL TAMPER ONLY IF THE CONCRETE SLUMP IS 3" OR LESS.
B) CURBS 6" OR LESS IN WIDTH AND 12" OR LESS IN HEIGHT MAY BE CONSOLIDATED BY BATTERY-POWERED VIBRATOR OR BY MANUAL RODDING.

HYDRAULIC TESTING OF CONCRETE WATER-RETAINING STRUCTURES (INCLUDING CHEMICAL CONTAINMENT STRUCTURES), SHALL BE PER ACI 350.1-10, WITH A MAXIMUM LOSS OF 0.0125%/ DAY AS THE QUANTITATIVE CRITERION. THE ENGINEER OF RECORD SHALL WITNESS ALL QUANTITATIVE AND QUALITATIVE TESTING AND APPROVE THE WATERTIGHTNESS OF THE TANK PRIOR TO BACKFILL

SLEEVES, OPENINGS, CONDUIT, AND OTHER EMBEDDED ITEMS NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE APPROVED BY THE STRUCTURAL ENGINEER BEFORE POURING. NO SLEEVE, OPENING, OR INSERT MAY BE PLACED IN BEAMS, JOISTS, OR COLUMNS UNLESS APPROVED BY THE ENGINEER. CONDUITS EMBEDDED IN SLABS SHALL NOT BE LARGER IN OUTSIDE DIMENSION THAN ONE THIRD OF THE THICKNESS OF THE SLAB AND SHALL NOT BE SPACED CLOSER THAN THREE DIAMETERS ON CENTER.
PROVIDE 3/4" CHAMFERS ON ALL EXPOSED CONCRETE EDGES, UNLESS NOTED OTHERWISE. WHERE INDICATED OR REQUIRED, SLOPE CONCRETE SLABS TO DRAINS SHOWN ON PLUMBING AND/OR ARCHITECTURAL DRAWINGS.

ALL CONCRETE SHALL BE CURED IMMEDIATELY AFTER FINISHING OPERATIONS, FOR A PERIOD OF AT LEAST 7 CONSECUTIVE CALENDAR DAYS.

WEATHER RESISTANCE: ALL CONCRETE EXPOSED TO CHLORIDES SHALL CONTAIN A CALCIUM-NITRITE BASED CORROSION-INHIBITING ADMIXTURE DURING THE BATCHING PROCESS. THE DOSAGE FOR CONCRETE EXPOSED TO AIRBORNE CHLORIDES SHALL BE MINIMUM TWO GALLONS PER CUBIC YARD. THE WATER CONTAINED IN THE CORROSION-INHIBITING ADMIXTURE SHALL BE USED IN THE CALCULATION OF THE WATER-TO-CEMENTITIOUS RATIO OF THE CONCRETE. PROVIDE RHEOCRETE CNI BY MASTER BUILDERS OR APPROVED EQUIVALENT.

SHORING AND RESHORING: SHORING AND RESHORING SHALL CONFORM TO ACI 347-01. SHORING AND SUPPORTING FORMWORK SHALL NOT BE REMOVED FROM HORIZONTAL MEMBERS BEFORE CONCRETE STRENGTH IS AT LEAST 70 PERCENT OF DESIGN STRENGTH, AS DETERMINED BY FIELD CURE CYLINDERS. IN ADDITION, SHORING SHALL NOT BE REMOVED SOONER THAN RECOMMENDED BY ACI 347-01 , SECTION 3.7.2.3. FORMWORK SHALL NOT BE REMOVED IN LESS THAN TEN (10) DAYS.

REINFORCING STEEL: ALL REINFORCING BARS SHALL BE GRADE 60 DEFORMED BARS CONFORMING TO ASTM A706 OR A615.
REINFORCING STEEL TO BE WELDED OR FIELD BENT SHALL CONFORM TO ASTM A706.
WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185, UNLESS OTHERWISE NOTED.
REINFORCING STEEL SHALL BE SECURELY TIED IN PLACE WITH #16 ANNEALED IRON WIRE.

ALL DETAILING AND ACCESSORIES SHALL CONFORM TO ACI DETAILING MANUAL SP-66. PROVIDE CHAIRS, SPACERS, BOLSTERS, AND ITEMS IN CONTACT WITH FORMS WITH HOT-DIP GALVANIZED LEGS OR PLASTIC LEGS. ACCURATELY POSITION, SUPPORT, AND SECURE REINFORCEMENT AGAINST DISPLACEMENT BY FORMWORK CONSTRUCTION OR CONCRETE PLACEMENT OPERATIONS. "WET-STICKING" OF REINFORCING IS PROHIBITED.

REQUIRED CONCRETE COVER FOR REINFORCING STEEL (UNLESS NOTED OTHERWISE):

WATER RETAINING STRUCTURES:		
	CONCRETE PLACED AGAINST EARTH	3"
	OTHER FORMED OR FINISHED SURFACES	2"
OTHER CONCRETE		
	FOOTINGS	3" BOTTOM, 2" TOP & SIDES
	SLABS	3/4" MINIMUM
	COLUMNS	1½" TO TIES, 2" TO PRINCIPLE REINFORCEMENT
	BEAMS	1½" TO STIRRUPS, 2" TO PRINCIPLE REINFORCEMENT
	WALLS	1½" TO DRY CONDITIONS, 2" TO EARTH, WATER OR WEATHER

LAP SPLICE CONTINUOUS VERTICAL OR HORIZONTAL BARS IN CONCRETE MEMBERS IN ACCORDANCE WITH ACI 318-19, FOR CLASS "B" TENSION LAP SPLICES OR ACI 350 WHICHEVER IS GREATER. DO NOT SPLICE CONTINUOUS TOP BARS IN BEAMS AT ENDS OF CLEAR SPANS. DO NOT SPLICE CONTINUOUS BOTTOM BARS IN BEAMS IN CLEAR SPANS BETWEEN SUPPORTS. AT CYLINDRICAL WALLS, HOOP REINFORCEMENT SPLICES SHALL BE STAGGERED BY NOT LESS THAN ONE LAP LENGTH OR 3 FEET, AND SHALL NOT COINCIDE IN VERTICAL ARRAYS MORE FREQUENTLY THAN EVERY THIRD BAR.
SHOW ALL SPLICES ON SHOP DRAWINGS. SPLICE LOCATIONS AND METHODS SUBJECT TO APPROVAL OF ENGINEER OF RECORD.

AT SLAB AND WALL OPENINGS PROVIDE A MINIMUM OF (2) #5 BARS ALL FOUR SIDES AND DIAGONALLY; EXTEND THESE BARS A LAP DISTANCE OR A MINIMUM OF 27" PAST THE OPENING OR HOOK BARS IF DISCONTINUOUS.

DOWEL ALL WALLS AND COLUMNS TO FOOTINGS WITH HOOKED BAR SIZE AND SPACING TO MATCH VERTICAL REINFORCING UNLESS OTHERWISE SHOWN.

BARS SHALL BE FREE OF LOOSE SCALE, DIRT, GREASE OR ANY OTHER SUBSTANCES THAT IMPAIR THE BOND BETWEEN CONCRETE AND REINFORCING BARS.

CONCRETE ACCESSORIES:
WATERSTOPS SHALL BE INSTALLED IN ALL CONSTRUCTION JOINTS AND SHALL BE SPLICED IN ACCORDANCE WITH THE WATERSTOP MANUFACTURER'S RECOMMENDATIONS. PROVIDE GREENSTREAK #703 OR APPROVED EQUAL.

HEADED SHEAR STUDS SHALL BE NELSON HEADED ANCHORS WITH FLUXED ENDS OR APPROVED EQUAL. DEFORMED BAR ANCHORS (DBA) SHALL BE NELSON, TYPE D2L, OR APPROVED. STUDS AND DBA SHALL BE AUTOMATICALLY END WELDED WITH THE MANUFACTURER'S STANDARD EQUIPMENT IN ACCORDANCE WITH THEIR RECOMMENDATIONS. HAND WELDING NOT PERMITTED.

PERMANENTLY EXPOSED EMBEDDED PLATES AND ANGLES SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION, OR STAINLESS STEEL. ACCURATELY POSITION, SUPPORT, AND SECURE EMBEDDED ITEMS AGAINST DISPLACEMENT BY FORMWORK CONSTRUCTION OR CONCRETE PLACEMENT OPERATIONS. SECURELY ATTACH EMBEDDED ITEMS TO FORMWORK PRIOR TO START OF CONCRETE PLACEMENT. "WET-STICKING" OF EMBEDDED ITEMS IS PROHIBITED. NO LOADS OR WELDS SHALL BE PLACED ON EMBEDDED PLATES OR ANGLES FOR A MINIMUM OF 7 DAYS AFTER CASTING.

WHERE NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE, THE EXISTING CONCRETE SURFACE SHOULD BE CLEANED AND ROUGHENED TO A MINIMUM ¼" AMPLITUDE.

MECHANICAL ANCHORS: MECHANICAL ANCHORS SHALL HAVE A CURRENT ICC-ES EVALUATION REPORT INDICATING CONFORMANCE WITH CURRENT APPLICABLE ICC-ES ACCEPTANCE CRITERIA AC193. MECHANICAL ANCHORS SHALL BE SCREW TYPE OR AS NOTED ON THE DRAWINGS. PROVIDE SPECIAL INSPECTION AS MANDATED BY THE APPLICABLE BUILDING CODE AND BUILDING OFFICIAL HAVING JURISDICTION.

SCREW STYLE ANCHORS SHALL BE ONE PIECE 316 STAINLESS STEEL SCREW ANCHOR WITH FINISHED HEX HEAD WITH INTEGRAL WASHER, DOUBLE LEAD THREAD, CHAMFERED TIP, RATCHET TEETH ON UNDERSIDE OF HEAD. PROVIDE ANCHORS HEAD STAMPED WITH LENGTH. TYPE AND SIZE AS INDICATED ON DRAWINGS. ACCEPTABLE ANCHORS IN 'CRACKED' AND 'UN-CRACKED' CONCRETE ARE SIMPSON TITEN HD (ICC-ES ESR-2713), HILTI KWIK HUS-EZ (ICC-ES ESR-3027) OR POWERS WEDGE BOLT+ (ICC-ES ESR-2526).

IDENTIFY POSITION OF REINFORCING STEEL AND OTHER EMBEDDED ITEMS PRIOR TO DRILLING HOLES FOR ANCHORS. EXERCISE CARE IN CORING OR DRILLING TO AVOID DAMAGING EXISTING REINFORCING OR EMBEDDED ITEMS. NOTIFY THE ENGINEER IF REINFORCING STEEL OR OTHER EMBEDDED ITEMS ARE ENCOUNTERED DURING DRILLING.

ADHESIVE ANCHORS: ADHESIVE ANCHORS SHALL HAVE A CURRENT ICC-ES EVALUATION REPORT INDICATING CONFORMANCE WITH CURRENT APPLICABLE ICC-ES ACCEPTANCE CRITERIA (AC308 FOR INSTALLATION IN CONCRETE OR AC58 FOR INSTALLATION IN MASONRY). ADHESIVE SHALL BE INSTALLED IN DRY HOLES AND HAVE PERFORMANCE DATA FOR INSTALLATIONS IN WATER-SATURATED HOLES. CONTRACTOR SHALL NOTIFY THE ENGINEER-OF-RECORD PRIOR TO INSTALLING ADHESIVE ANCHORS IN WATER-SATURATED (DAMP) HOLES. ADHESIVE SHALL BE FULLY-CURED AT 70°F WITHIN 24 HOURS FROM THE TIME OF INSTALLATION. U.N.O. CONCRETE SHALL BE A MINIMUM OF 21 DAYS OLD AT THE TIME OF INSTALLATION PER ACI 318-14 CHAPTER 17.

ACCEPTABLE FAST CURE ADHESIVE IN 'CRACKED' AND 'UN-CRACKED' CONCRETE ARE SIMPSON AT-XP (IAPMO UES ER-263), HILTI HIT-HY 200 (ICC-ES ESR-3187) OR POWERS AC100+ GOLD (ICC-ES ESR-2582); IN SOLID-GROUTED MASONRY ARE SIMPSON AT-XP (IAPMO UES ER-281) OR HILTI HIT-HY 270 (ICC-ES ESR-4143. DESIGN OF THESE ADHESIVES IS BASED ON CONCRETE TEMPERATURE RANGE 'A' OR '1'.

ACCEPTABLE SLOW CURE ADHESIVE IN 'CRACKED' AND 'UNCRACKED' CONCRETE ARE SIMPSON SET-XP (ICC-ES ESR-2508), HILTI HIT-RE 500-SD (ICC-ES ESR-2322) OR POWERS PE1000+ (ICC-ES ESR-2583); IN SOLID-GROUTED MASONRY ARE SIMPSON SET-XP (IAPMO UES ER-265). DESIGN OF THESE ADHESIVES IS BASED ON CONCRETE TEMPERATURE RANGE 'A' OR '1'.

THREADED STUDS SHALL CONFORM TO ASTM A36, UNLESS NOTED OTHERWISE. PERMANENTLY EXPOSED THREADED STUDS AND THREADED STUDS USED IN WATER BEARING STRUCTURES SHALL BE 316 STAINLESS STEEL. NUTS AND WASHERS SHALL CONFORM TO SAME SPECIFICATION AS THE SUPPLIED ANCHOR RODS.

INSTALLATION SHALL BE IN CONFORMANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPI). INSTALLATION SHALL ALSO INCLUDE BRUSHING AND CLEANING OF DRILLED HOLES WITH COMPRESSED AIR AS REQUIRED BY THE APPLICABLE EVALUATION REPORT. INSTALLERS SHALL BE TRAINED BY THE MANUFACTURER'S REPRESENTATIVE. EMBEDMENT SHALL BE AS INDICATED ON THE STRUCTURAL DRAWINGS.

IDENTIFY POSITION OF REINFORCING STEEL AND OTHER EMBEDDED ITEMS PRIOR TO DRILLING HOLES FOR ANCHORS. EXERCISE CARE IN CORING OR DRILLING TO AVOID DAMAGING EXISTING REINFORCING OR EMBEDDED ITEMS. NOTIFY THE ENGINEER IF REINFORCING STEEL OR OTHER EMBEDDED ITEMS ARE ENCOUNTERED DURING DRILLING.

REINFORCED CONCRETE RESERVOIR

REINFORCED CONCRETE RESERVOIR CONTRACTOR SHALL PROVIDE DESIGN AND CONSTRUCTION OF REINFORCED CONCRETE RESERVOIR WITH CONSIDERATION OF THE STRUCTURAL MATERIALS NOTED HEREIN. REINFORCED CONCRETE RESERVOIR DRAWINGS AND CALCULATIONS SHALL BEAR THE SEAL AND SIGNATURE OF A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF OREGON.
DRAWINGS AND CALCULATIONS SHALL BE SUITABLE FOR OBTAINING A BUILDING PERMIT.
BAKER SILO, LLC., LYNDEN, WA, (360)354-4940 OR APPROVED EQUAL

EXPERIENCE: THE CONTRACTOR RESPONSIBLE FOR DESIGN AND CONSTRUCTION OF THE REINFORCED CONCRETE RESERVOIR SHALL PROVIDE A STATEMENT OF QUALIFICATIONS SHOWING EXPERIENCE OF HAVING DESIGNED AND BUILT A MINIMUM OF TEN SIMILAR REINFORCED CONCRETE RESERVOIRS IN THE LAST FIVE YEAR.

WARRANTY: THE CONTRACTOR RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE REINFORCED CONCRETE RESERVOIR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF FIVE YEAR AFTER COMPLETION, ACCEPTANCE, TESTING AND FILLING OF THE RESERVOIR.

PLACEMENT OF REINFORCING STEEL: COMPLY WITH ACI 318-LATEST EDITION. LAPS AND SPLICES SHALL BE STAGGERED AND ALL REINFORCING STEEL BE ACCURATELY PLACED. ALL REINFORCING STEEL SHALL BE FIRMLY SECURED TO PREVENT MOVEMENT DURING THE PLACING OF THE CONCRETE.

PLACEMENT OF CONCRETE: PLACE CONCRETE WITHIN 90 MINUTES OF BATCHING. BEFORE EACH POUR THE PREVIOUSLY PLACED CONCRETE SHALL BE THOROUGHLY CLEANED TO REMOVE ALL LOOSE SCALE, OIL AND ANY FOREIGN MATERIAL THAT MAY PREVENT A GOOD BOND WITH THE EXISTING CONCRETE. CONCRETE SHALL NOT BE ALLOWED TO FREE FALL MORE THAN 5 FEET DURING PLACEMENT. DEPOSIT CONCRETE IN HORIZONTAL LAYERS NOT TO EXCEED 18 INCHES IN DEPTH AND PLACE AS CLOSE AS POSSIBLE TO FINAL POSITION TO AVOID SEGREGATION. VIBRATE ALL CONCRETE DURING PLACEMENT WITH HIGH FREQUENCY INTERNAL VIBRATORS AS IT IS PLACED TO THOROUGHLY WORK THE CONCRETE AROUND REINFORCEMENT AND EMBEDDED ITEMS WITHOUT SEPARATION OF AGGREGATE.

FORM REMOVAL: ALLOW WALL FORMS TO REMAIN IN PLACE AT LEAST 16 HOURS AFTER CONCRETE HAS BEEN PLACED UNLESS LOW TEMPERATURES OR POOR WEATHER CONDITIONS REQUIRE MORE CURE TIME. ALLOW ROOF FORMS TO REMAIN IN PLACE FOR A MINIMUM OF 7 DAYS UNLESS LOW TEMPERATURES OR POOR WEATHER CONDITIONS REQUIRE MORE CURE TIME.

CONCRETE FINISHES: BASE SLAB AND ROOF SHALL BE A "WOOD FLOAT" FINISH TO PREVENT SLIPPERY SURFACES. UNDERSIDE OF ROOF SHALL BE ROUGH FORM FINISH. WALLS SHALL BE STEEL FORM FINISH WITH MINIMUM REFINEMENT. ROCK POCKETS, HONEYCOMBS, FORM TIE HOLES AND ANY VOIDS OVER 1/2 INCH DEEP SHALL BE REPAIRED. CONTACT ENGINEER OF RECORD PRIOR TO REPAIRS.

CLEAN AND PRESSURE WASH THE INTERIOR OF THE RESERVOIR AFTER CONSTRUCTION.

TOLERANCES:
BASE SLAB POSITION IN PLAN: +1/2 INCH
BASE SLAB DEPARTURE FROM LEVEL: +1/2 INCH AND -1/2 INCH
WALL DEPARTURE FROM PLUMB OR BATTER: 0.3% X HEIGHT < 1 INCH
VARIATION IN THICKNESS OF SLABS AND WALLS: +1/2 INCH AND -1/4 INCH
DEPARTURE IN LOCATION OF OPENINGS: +1/4 INCH AND -1/4 INCH
ABRUPT IRREGULARITIES (USING A 5' LONG STRAIGHT EDGE): +1/2" & -1/4"

TESTING: FILL THE RESERVOIR TO CHECK FOR WATER TIGHTNESS AFTER A MINIMUM OF 28 DAYS HAS PASSED SINCE THE LAST CONCRETE POUR. CHECK THE WATER LEVEL AFTER 3 CONSECUTIVE 24 HOUR PERIODS. ALLOWING FOR EVAPORATION, THE WATER LEVEL SHALL NOT DROP MORE THAN 1 TENTH OF ONE PERCENT IN ANY 24 HOUR PERIOD.

CRACKING: CRACKS WIDER THAN 0.005 INCHES THAT FORM WITHIN THE WARRANTY PERIOD SHALL BE CLEANED, REPAIRED AND INJECTED BY AN APPROVED EPOXY SEALING SYSTEM OR ADDITIONAL CONCRETE SHALL BE PLACED TO MAINTAIN WATER TIGHTNESS.

WEEPING AND EFFLORESCENCE: ACTIVE LEAKAGE OR EXCESSIVE EFFLORESCENCE THAT OCCURS WITHIN THE WARRANTY PERIOD SHALL BE CLEANED, REPAIRED AND INJECTED WITH AN APPROVED EPOXY SEALING SYSTEM OR ADDITIONAL CONCRETE SHALL BE PLACED TO MAINTAIN WATER TIGHTNESS. EXCESSIVE EFFLORESCENCE IS DEFINED AS EFFLORESCENCE PROJECTING MORE THAN 1/2 INCH FROM THE FINISH CONCRETE SURFACE OR ANY EFFLORESCENCE IN A CONTINUOUS LINE EXCEEDING 10 FEET IN LENGTH.

GENERAL STRUCTURAL NOTES

COORDINATION: CONSULT MECHANICAL DRAWINGS FOR SLEEVES, DEPRESSIONS, PENETRATIONS AND OTHER DETAILS REQUIRED FOR THE REINFORCED CONCRETE RESERVOIR.

CONTRACTOR SHALL LOCATE ALL CONCEALED UTILITIES PRIOR TO EXCAVATION OR SELECTIVE DEMOLITION WORKS. THE ENGINEER OR RECORD SHALL BE NOTIFIED OF POTENTIAL CONFLICTS BETWEEN FOUNDATIONS AND BURIED UTILITIES.

CODE REQUIREMENTS: THE STRUCTURES ARE DESIGNED IN ACCORDANCE WITH THE 2019 OREGON STRUCTURAL SPECIALTY CODE (OSSC) AND REFERENCE DOCUMENTS (ADM, ACI, AISC, AISI, ANSI, APA, ASCE/SEI, ASTM, AWC, AWPA, AWS, ICC, SDI, SJI, TMS, UL, WCLIB, ETC). FOLLOW ALL APPLICABLE PROVISIONS FOR ALL PHASES OF CONSTRUCTION.

TEMPORARY CONDITIONS: THE STRUCTURAL INTEGRITY OF THE COMPLETED STRUCTURE DEPENDS ON INTERACTION OF VARIOUS CONNECTED COMPONENTS. PROVIDE ADEQUATE BRACING, SHORING, AND OTHER TEMPORARY SUPPORTS AS REQUIRED TO SAFELY COMPLETE THE WORK. THE STRUCTURE SHOWN ON THE DRAWINGS HAS BEEN DESIGNED FOR STABILITY UNDER FINAL CONFIGURATION ONLY.

WALLS WHICH TIE TO UPPER SLABS SHALL NOT BE BACKFILLED UNTIL THE UPPER SLABS REACH FULL STRENGTH, UNLESS ADEQUATE BRACING IS PROVIDED AT THE TOP OF THE WALL.

EXISTING CONDITIONS: ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS SHALL BE FIELD VERIFIED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR RECORD OF ANY SIGNIFICANT DISCREPANCIES FROM CONDITIONS SHOWN ON THE DRAWINGS.

EXISTING STRUCTURE: INFORMATION FOR EXISTING STRUCTURES WAS TAKEN FROM RECORD DRAWINGS PROVIDED BY THE CITY OF SWEET HOME. WORK SHOWN ON THESE PLANS ASSUMES THAT THE ORIGINAL CONSTRUCTION WAS PERFORMED IN ACCORDANCE WITH THE ORIGINAL DRAWINGS INCLUDING, BUT NOT LIMITED TO, DIMENSIONS, ELEVATIONS, MEMBER SIZES, MATERIALS, DETAILS, ETC. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE CONDITIONS RELATING TO THE EXISTING STRUCTURES AND TO NOTIFY THE ENGINEER OR RECORD IMMEDIATELY OF ANY DISCREPANCIES OR CONFLICTS.

EXERCISE EXTREME CARE AND CAUTION WHEN EXCAVATING AND FILLING ADJACENT TO EXISTING STRUCTURES. UNDER NO CIRCUMSTANCES SHALL THE STRUCTURAL INTEGRITY OF THE EXISTING STRUCTURES BE IMPAIRED IN ANY WAY BY CONSTRUCTION OPERATIONS AND PROCEDURES. DO NOT EXCAVATE OR DISTURB SOIL ADJACENT TO OR BENEATH EXISTING FOOTINGS.

DESIGN CRITERIA: THE FOLLOWING LOADS AND PARAMETERS WERE USED TO DETERMINE WIND AND SEISMIC LOADS.

VERTICAL LOADS:
DEAD LOADS:
CONCRETE SLABS: 150 PCF DL

GROUND SNOW LOAD: 25 PSF SL

FLOOR LIVE LOADS:
PROCESS 125 PSF LL, 2000 LB CONCENTRATED

LATERAL LOADS:
SEISMIC: RISK CATEGORY 3, SITE CLASS B, S_S=0.63, S_1=0.34, F_a=1.00, F_v=1.00, S_{MS}=0.63g, S_{M1}=0.34g, S_{DS}=0.42g, S_{D1}=0.23g, MCE_R=0.29g, F_{PGA}=1.00, SEISMIC DESIGN CATEGORY=D.

WIND: BAS

Exhibit B

Geotechnical Data Report

City of Sweet Home
Mahler Water Reclamation Facility Improvements

Geotechnical Data Report

Final Submittal

Prepared for

December 2022

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Appendices

Appendix A Boring Logs
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Acronyms and Abbreviations

ASTM	American Society for Testing and Materials
bgs	below ground surface
bpf	blows per foot
GDR	Geotechnical Data Report
$I_{S(50)}$	point load index
LBVS	Little Butte Volcanic Series
MJA	McMillen Jacobs Associates
N-value	standard penetration test blows to advance final foot
OAR	Oregon Administrative Rules
PGA	peak ground acceleration
RQD	Rock Quality Designation
SPT	Standard Penetration Test
USGS	United States Geological Survey
West Yost	West Yost Associates, Inc.
WRF	Wastewater Reclamation Facility

Distribution

To: Preston Van Meter, P.E.
West Yost Associates, Inc.

From: Wolfe Lang, P.E., G.E.
McMillen Jacobs Associates

Prepared By: Jeff Quinn, P.E.
McMillen Jacobs Associates

Reviewed By: Wolfe Lang, P.E., G.E.
McMillen Jacobs Associates

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Final Submittal	July 22, 2022	Final Submittal to West Yost
Final Submittal Rev. 1	December 16, 2022	Final Submittal Incorporating Site Revisions

1.0 Introduction

1.1 General

McMillen Jacobs Associates (MJA) has been retained by West Yost Associates, Inc. (West Yost) to provide geotechnical engineering services for the City of Sweet Home Mahler Water Reclamation Facility Improvements project. The project owner is the City of Sweet Home. The Project site location is shown in the Vicinity Map, Figure 1. This Geotechnical Data Report (GDR) presents the results of our field explorations and laboratory testing, as well as a discussion on the site geology.

1.2 Project Description

The City of Sweet Home Mahler Water Reclamation Facility (WRF) is located at 1357 Pleasant Valley Road, in Sweet Home, Oregon. The WRF has been in service since 1947 with two major upgrades completed in 1974 and 1994 (Brown & Caldwell, 2016). Our project understanding is based on our communication with West Yost and the 90 percent submittal plans entitled *Mahler Water Reclamation Facility Improvements Project – Phase 1*, dated June 2022, prepared by West Yost. The proposed WRF improvements are shown in Figure 2.

The proposed WRF improvements include the following:

- *Main Electrical and Blower (MEB) Building*: The 22- by 67.5-foot MEB Building will be located within the north-central part of the WRF site. The interior of the building will be supported on a 6-inch-thick slab on grade foundation, while the perimeter of the structure will be supported on a 1.5-foot-wide continuous spread footing. A new generator, which will be installed on the north side of the MEB Building, will be supported on 12- by 28-foot, 12-inch-thick reinforced concrete slab on grade with thickened edges. Site grades will be raised up to approximately 6 feet in this area to facilitate construction of the MEB Building, with approximately 4 to 6 feet of fill placed below the building footprint. The approximately 6-foot-tall fill slope on the east side of the MEB Building will descend at 2H:1V (horizontal:vertical).
- *Influent Pump Station (IPS)*: The new, 40- by 56-foot IPS will be constructed just north of the existing IPS, within the southeast corner of the WRF site. The approximate southern half of the IPS structure, which supports above-grade piping, will be supported on a 12-inch-thick reinforced concrete slab on grade with thickened edges. The approximate northern half of the IPS structure, which houses five submerged pumps, will be supported on a 28-inch-thick reinforced concrete slab with a base elevation of approximately 491.2 feet (e.g., about 26.2 feet below grade).
- *Sludge Blend Tank*: The new, 28-foot diameter sludge blend tank will be constructed in the southeast corner of the WRF site just east of the solids building. The sludge blend tank will be approximately 25 feet tall and will be supported on a 1.5-foot-thick, reinforced concrete mat foundation with a base elevation of approximately 515.3 feet (e.g., about 1.5 feet below grade).
- *Digested Sludge Holding Tank*: The new, 36-foot diameter sludge blend tank will be constructed in the southeast corner of the WRF site just north of the sludge blend tank. The sludge blend tank

will be approximately 26 feet tall and will be supported on a 1.5-foot-thick, reinforced concrete mat foundation with a base elevation corresponding to approximately 1.5 feet below grade.

- *Solids Building Expansion*: The existing solids building will be enlarged from its existing 22- by 37-foot plan dimensions to approximately 32- by 57-foot plan dimensions and will be supported on a shallow foundation system consisting of perimeter footings and an interior slab-on-grade.
- *40*-foot Diameter Digestor: The new digestor will be constructed within the footprint of the existing, approximately 55-foot diameter digestor (DG1) in the southeast corner of the WRF site. We understand that the existing foundation will be used to support the new digestor structure.
- *Temporary Generator*: A temporary electrical generator, supported on an 18-inch-thick reinforced concrete slab, will be installed on the south side of existing Secondary Clarifier SC60.
- *Existing Bathroom Relocation*: The existing bathroom, currently along the northern fence line and east of the existing entrance gate, will be moved to the north side of the boat ramp access road.
- *Retaining Walls*: To support new fills placed for site grading, as well as proposed cuts, there are six retaining walls (designated Wall 1 through Wall 6) proposed as part of the improvements. The retaining walls will be cast-in-place, reinforced concrete cantilevered walls ranging in height from 2.5 to 6.75 feet.
- *Existing Structures/Facilities to Remain In Use*: Secondary Clarifier Nos. 1 through 3; RAS/WAS Pump Station; Aeration Basin; Chlorine Contact Chamber; Administration and Operations Building; Solids Building; Sand Filters; Lime Silo; and the electrical building on the south side of existing SC60.
- *Proposed Piping Improvements*: 12-inch storm drain;10-inch storm drain; 8-inch to 36-inch sanitary sewer; 12-inch IPS forcemain to headworks (HDPE pipe); 24-inch RS IPS to Headworks (HDPE pipe); 6-inch PS forcemain; 12-inch RDPS; 6-inch SL-WAS; 6-inch SL-D forcemain; 4-inch PSC; and 10-inch DIP waterline relocation.
- *Demolition of the Following Existing Structures*: Backwash Storage; Waste Backwash Storage; the approximately 25- by 50-foot storage building on the west side of the WRF site; and several buildings clustered together in the central portion of the WRF site including the carport, an approximately 40- by 40-foot CMU building, an approximately 25- by 50-foot Quonset Hut storage building, and an approximately 15- by 35-foot shed.
- *Primary Clarifier*: The new primary clarifier will consist of an approximately 65- by 85-foot reinforced concrete tank structure. The base depth of the new primary clarifier will be approximately 9.5 to 22.5 feet below existing site grades and will be supported on an 18-inch-thick, reinforced concrete mat foundation system. The primary clarifier will be expanded to the north (designated Primary Clarifier 4) at a future date.
- *Secondary Clarifier 90 (SC90)*: SC90 will consist of an approximately 95-foot diameter, 17-foot-tall reinforced concrete tank structure. SC90 will be a primarily below-grade structure, with the tank walls being about 2 feet above finish grade. The base depth of the SC90 will be approximately 15 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Building A (O&M and Controls)*: This 40- by 120-foot building, oriented northeast-southwest, will be constructed at the west end of the WRF site and will be an at-grade structure supported on

an interior slab-on-grade. The perimeter of the structure and interior load-bearing walls will be supported on shallow spread footings.

- *Building A (Headworks and Dewatering)*: This 40- by 120-foot building, oriented southeast-northwest, will abut the southeast corner of the O&M and Controls building to form the leg of the L-shaped Building A. This will be an at-grade structure supported on an interior slab-on-grade. The perimeter of the structure and interior load-bearing walls will be supported on shallow spread footings.
- *SC90 WAS and RAS Pump Stations*: Each of these two pump stations will be an approximately 10-foot diameter reinforced concrete vault structure with a base depth of approximately 16.5 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Existing Secondary Clarifier SC60 RAS/WAS Pump Station*: This pump station will be an approximately 10- by 20-foot reinforced concrete vault structure with a base depth of approximately 12.5 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Aeration Basin No. 3*: Aeration Basin No. 3 will consist of an approximately 40- by 75-foot reinforced concrete structure. The base depth of Aeration Basin No. 3 will be approximately 13 to 18 feet below existing site grades and will be supported on a reinforced concrete mat foundation. Aeration Basin No. 3 will be expanded to the north (designated Aeration Basin No. 4) at a future time and will likely be founded at the same depth as Aeration Basin No. 3.
- *Tertiary Filters*: The tertiary filters will be housed in an approximately 25- by 35-foot reinforced concrete tank structure. The base depth of Aeration Basin No. 3 will be approximately 18 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Tertiary Building, UV Disinfection, and UW Storage*: These facilities will be located adjacent to one another within an approximate 35- by 40-foot area. The UW Storage and UV Storage facilities will be constructed within the existing chlorine contact chamber. The portion of the Tertiary Building housing the utility water pumps will likely be approximately 7 feet below existing site grades.
- *Outfall*: The outfall pipe leads from the UV disinfection chamber to the South Santiam River. This will be part of a future project phase.
- *Other Improvements*: The approximate western half of the WRF site, an area north of the boat ramp access drive, and a narrow area along the south site boundary will be surfaced with gravel. New asphalt pavements along the entrance road from Pleasant Valley Road and within most of the WRF site; new concrete curbs and sidewalks; two new entrance gates; and a new chain-link fence.

1.3 Purpose and Scope of Work

The primary purpose of this GDR is to compile sufficient geologic and geotechnical data at the project site to support the design and construction of the proposed improvements. This GDR presents a summary of geologic and geotechnical data collected from field explorations and testing, laboratory testing, a review of published geological sources, and other historical geotechnical information related to the project. Information contained in this GDR will be used to characterize subsurface conditions at the site and to develop recommendations for design and construction of the Project.

2.0 Site Conditions

2.1 Site Description

The existing WRF site is located on the south bank of the South Santiam River near its confluence with Ames Creek. The site is bordered by the Albany and Eastern railroad tracks to the south, a boat ramp access road and the South Santiam River beyond, private property to the west, and Ames Creek to the east. In general, the site slopes gently from the west to the east (i.e., towards Ames Creek) and gently from the south to the north towards the South Santiam River. The eastern two-thirds of the site, where most of the WRF is located, is situated on a relatively level terrace that generally sits 5 to 7 feet lower than the western one-third of the site and approximately 10 feet above Ames Creek to the east.

A paved access road runs along the north side of the site, from the Pleasant Valley Road WRF entrance at the west end of the site to the boat ramp and recreation use area at the north-northeast end of the site that provides public access to the South Santiam River. The paved WRF road, heading south from the access road from the main entrance gate, provides access to the main areas within the WRF. Bedrock is exposed along the South Santiam River and Ames Creek approximately 100 feet to the north-northeast of the site. Exposed bedrock on the riverbank slopes steeply into the river.

2.2 Regional Geology

The project site is located in the foothills of the Western Cascades, a north-south trending physiographic region that stretches from northern California to British Columbia, tucked between the Willamette Valley to the west and the younger High Cascades to the east. The Western Cascades in Oregon were formed by a series of volcanic events from approximately 35 to 17 million years ago. The region is marked by densely forested hills dissected by the region's many rivers (Madin, 1990; Schlicker and Deacon, 1967; Wilson, 1998; Popowski, 1996).

The Paleogene structural basement of this region of the Western Cascades is composed of non-marine volcaniclastic sedimentary rocks, tuff, basaltic andesite, andesite, and dacite of the Late Eocene to Oligocene Fisher Formation. The Fisher Formation is overlain by basalt lavas, ash-flow tuff, tuff, and non-marine sedimentary rocks of the Little Butte Volcanic Series. A subducting plate below the Eocene shoreline resulted in a volcanic chain that produced the volcanic activity responsible for the Fisher Formation and the Little Butte Volcanic Series. As the angle of the subducting plate shifted, the volcanic activity gradually shifted east of the region. The bedrock in the project area is composed of tholeiitic basalt from the Little Butte Volcanic Series.

Over the span of geologic time, quaternary sedimentary deposits of alluvium, colluvium, landslide deposits, and terrace deposits have accumulated on the volcanic rock surfaces and in the valleys formed by the rivers. The sediments that directly overlie the bedrock in the project area have been defined as alluvium. Regionally, the alluvium consists of unconsolidated gravel, sand, silt, and clay deposited in modern stream channels, adjoining flood plains, overbanks, and low bedrock terraces.

Across the project area, fill materials are present near the ground surface. These materials were generally placed to re-grade the site prior to development.

3.0 Site Investigations

3.1 General

The subsurface exploration was completed in four phases, between 2018 and 2022, and consisted of five boreholes (designated B-1 through B-5) and 36 probe-holes (designated P-01 through P-36).

The site investigations were performed under the direction of a geologist or geotechnical engineer from MJA, who examined and logged the soil and rock conditions encountered in the borings. The soils were classified in the field in accordance with the Visual-Manual Procedure (ASTM D 2488). Sample depths, stratigraphy, groundwater occurrence and soil engineering characteristics were also recorded. The stratigraphic contacts indicated on the logs represent the approximate boundaries between soil and rock; actual transitions may be more gradual. The boring logs are presented in Appendix A. The soil and rock samples were transported to the MJA Portland office for further examination. The rock core samples were transported, stored, cataloged, and disposed of in accordance with the Standard Practices for Preserving and Transporting Rock Core Samples (ASTM D 5079). The rock core photos are included in Appendix B

3.2 Exploratory Borings

Phase one was completed between April 30 and May 2, 2018, and included the advancement of five boreholes (B-1 through B-5) and fifteen probe-holes (P-01 through P-15). The Phase one borings were completed by Western States Soil Conservation (WSSC) of Hubbard, Oregon using a truck-mounted CME-75 drill rig. The boreholes were advanced to depths ranging from 5.8 to 23 feet bgs using mud-rotary drilling techniques within soil materials, and HQ-triple-tube wireline coring in rock materials in accordance with ASTM D 2113. The probe-holes were advanced using hollow-stem auger drilling techniques and extended to depths ranging from 2.5 to 15 feet bgs at which point drilling refusal was encountered at the top of the bedrock surface.

Phase two was completed on October 29, 2019 and consisted of the advancement of 12 probe-holes (designated P-16 through P-27). The phase two probe-holes were completed by McCallum Rock Drilling of Salem, Oregon using a track-mounted Furakawa 900 drill rig. The probe-holes were advanced to depths ranging from 11 to 26 feet bgs using air percussion drilling methods.

Phase three was completed on June 20, 2022 and consisted of eight probe-holes (designated P-28 through P-35) advanced by PLI Systems of Hillsboro, Oregon using a truck-mounted Mobile B-75 drill rig. The probe-holes were advanced using hollow-stem auger drilling techniques and extended to depths ranging from 3.7 to 19 feet bgs.

Phase four was completed on November 22, 2022 and consisted of one probe-hole (designated P-36) advanced by WSSC using a truck-mounted CME-75 drill rig. P-36 was advanced using hollow-stem auger drilling techniques and extended to 11.5 feet bgs.

In borings B-2 through B-5 and probe-holes P-28 through P-36, disturbed soil samples were collected in conjunction with a SPT at selected intervals using a standard 2-inch diameter split-barrel sampler, and automatic safety hammer system. In each test, the sampler was advanced 18 inches by dropping the 140-

pound hammer a distance of 30 inches for each strike in accordance with ASTM D 1586. The number of hammer blows for each six inches of penetration was recorded. The standard penetration resistance (N-value) of the soil is calculated as the sum of the number of blows required for the final 12 inches of sampler penetration. The SPT N-values of greater than 50 blows per six inches of penetration is referred to as refusal. The N-value is an indication of the relative density of granular soils and the relative consistency of cohesive soils. Uncorrected N-values are presented on the boring logs. In addition to the SPT sampling, relatively undisturbed samples were obtained in selected borings by pushing a 3-inch inside diameter thin wall sampler (Shelby Tube) in accordance with ASTM D 1587.

In the probe-holes in which SPT sampling was not performed, soil samples were taken from borehole cuttings. These sampling locations are shown in boring logs.

3.3 Piezometers

Two-inch diameter piezometers were installed in two boreholes to allow for long-term, stabilized groundwater level measurements. Piezometers were installed in the following boreholes:

- Boring B-3, screened between 9 and 12 feet bgs.
- Boring B-5, screened between 5.5 and 8.5 feet bgs.

3.4 Borehole Backfill and Abandonment

Piezometer construction and borehole backfilling and abandonment was performed in accordance with the requirements of the Oregon Department of Water Resources (OAR 690-240, Construction, Maintenance, Alteration, Conversion, and Abandonment of Monitoring Wells, Geotechnical Holes, and Other Holes in Oregon).

4.0 Laboratory Testing

Field samples obtained from exploratory borings were delivered to the MJA Portland office for further examination and storage. Each of the samples was re-examined and compared to the field boring log description to confirm the field classifications and maintain consistency. Representative samples were then selected for laboratory testing. Testing was performed on soil and rock samples from boreholes B-1, B-3, and B-5. The laboratory test results are provided in Appendix B. The laboratory testing included the following index and strength property tests, performed in accordance with relevant ASTM standards:

- Moisture content analyses (ASTM D 2216).
- Atterberg limits tests (ASTM D 4318).
- Point load tests of rock core (ASTM D 5731).
- Unconfined compressive strength of intact rock core (ASTM D 7012).

Point load testing was performed by MJA. All other laboratory testing was performed by Northwest Testing, Inc. of Wilsonville, Oregon. Laboratory test results are presented in Appendix B. A summary of the laboratory test results is provided in Table 4-1 on the following page. Comprehensive laboratory test results are presented in Appendix C.

Table 4-1. Laboratory Test Results Summary

Sample Location or ID				Soil Description			Moisture %	Atterberg Limits			Strength Testing		
											Point Load Strength Index, PLI	PLI Test Type	UCS[1]
Boring	Sample, No.	Top Depth (feet)	Bottom Depth (feet)	Geologic Unit	USCS Soil Type	Soil or Rock Description		Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Corrected Point Load Strength Index, $I_{s(50)}$ (PSI)	Diametral or Axial	PSI
B-1	R-1	5.2	6.3	LBVS Basalt		BASALT							25,302
B-3	S-2	5	6.5	FILL	CH	SANDY FAT CLAY	44.8	51	28	23			
B-5	S-1	2.5	4	FILL	SM	SILTY SAND with Gravel	26.3	44	28	16			
B-5	R-1	11.7	12.4	LBVS Basalt		BASALT							29,919
B-5	R-2	18.0	19.0	LBVS Basalt		BASALT							6,932
B-5	R-2	16.8	17.2	LBVS Basalt		BASALT					513	Diametral	12,563[2]
B-5	R-2	16.3	16.8	LBVS Basalt		BASALT					304	Diametral	7,437[2]
B-5	R-2	16.8	17.0	LBVS Basalt		BASALT					653	Diametral	13,717[2]
B-5	R-2	17.2	18.0	LBVS Basalt		BASALT					268	Diametral	5,098[2]
B-5	R-2	17.6	18.0	LBVS Basalt		BASALT					569	Diametral	13,951[2]
B-5	R-3	22.5	23.0	LBVS Basalt		BASALT					579	Diametral	13,315[2]
B-5	R-1	9.0	9.5	LBVS Basalt		BASALT					407	Diametral	9,778[2]
B-5	R-2	12.4	12.8	LBVS Basalt		BASALT					714	Diametral	17,138[2]
B-5	R-2	15.8	16.7	LBVS Basalt		BASALT					383	Diametral	9,185[2]
B-5	R-2	16.3	16.7	LBVS Basalt		BASALT					690	Diametral	14,493[2]

[1] UCS = Unconfined compressive strength.
[2] UCS results from point load strength index testing are based on a correlation factor of 24.5, which was calculated by plotting the relationship between UCS and point load strength index test results.

5.0 Subsurface Conditions

The materials encountered in the explorations were grouped into three geotechnical units: Pavement, Fill, Boulders, and Basalt (Little Butte Volcanic Series – Tholeiitic Basalt). These units have been defined by their geologic origin, stratigraphic position, engineering properties, and their distribution in the subsurface. Variations in subsurface conditions may exist between the locations of the borings. Contacts between the units may be more gradational than shown in the boring logs in Appendix A. The SPT N-values, shown on the boring logs and discussed below, are reported as counted in the field (uncorrected). Photos of rock core samples are provided in Appendix C. Cross sections of subsurface conditions are shown in Figures 3A through 3F. The following sections describe each geotechnical unit in greater detail.

5.1.1 Pavement

Asphalt concrete (AC) pavement was encountered in 12 borings (P-01, P-03, P-04, P-16, P-17, P-19, P-23, P-25, P-29, P-31, P-32, P-34, and P-36). The AC pavement ranged from about 4 to 6 inches in thickness and was typically underlain by about 4 inches of crushed rock base. Portland Cement Concrete (PCC) pavement was encountered in two borings (B-1 and P-27). In B-1, the PCC pavement was about 18 inches thick and underlain by about 12 inches of crushed rock base. In P-27, the PCC pavement section was about 6 inches thick.

5.1.2 Fill

Undocumented fill materials were present in all the explorations and were likely placed for site grading and development. We observed highly variable fill depths across the site, extending from the existing ground surface to depths ranging from 2 to 16.5 feet bgs. Additionally, the fill depths often varied considerably over short distances. The fill was underlain by bedrock, and generally consisted of silt with variable amounts of organics, lean to fat clay with variable amounts of sand and gravel, sand and gravel with variable amounts of silt and clay, and organic soil with variable amounts of sand. Undocumented fill refers to materials placed without (available) records of subgrade conditions or evaluation of compaction. Standard Penetration Tests (SPTs) conducted within the fill yielded N-values ranged from 0 to 45 blows per foot (bpf). The higher N-values were generally recorded at the fill-bedrock contact.

5.1.3 Boulders

Based on drilling action and slow advancement rates, we believe that large cobbles or boulders were encountered between 7.5 to 9 feet bgs in boring P-36, located in the southeast corner of the WRF site.

5.1.4 Basalt - Little Butte Volcanic Series Tholeiitic Basalt

The Little River Butte Volcanic Series (LRBV) in the project area consists of tholeiitic basalt and is bedrock in this area. The basalt was encountered beneath the fill in all the explorations. The contact between fill and LBVS was generally selected based on auger refusal, drilling resistance, drill cuttings, and/or SPT refusal (more than 50 blow counts for 6 inches or less of penetration). The depth to the LRBV ranged from 2.0 feet to 16.5 feet bgs.

The strength of the basalt rock generally varies from strong to very strong (R4 to R5). Rock strength descriptors are presented in Table 5-1. The basalt is slightly weathered to fresh, moderately to highly fractured (i.e., joint spacing from 3 feet to 2 inches), and gray. The joints were generally sub-horizontal or high angle, smooth to rough, planar, curved, and irregular in shape. The occasional joint had a less than 0.1-inch-thick light blue green coating. Core recovery ranged from 80 to 100 percent. The Rock Quality Designation of the cored rock (RQD) ranged from 42 to 86 percent, with an average value of 67 percent.

Table 5-1. Definition of Rock Strength Descriptions

Grade[1]	Approximate Uniaxial Compressive Strength (psi)	Qualitative Description
R0	35 – 150	Extremely Weak
R1	150 – 700	Very Weak
R2	700 – 3,600	Weak
R3	3,600 – 7,200	Medium Strong
R4	7,200 – 14,500	Strong
R5	14,500 – 36,000	Very Strong
R6	>36,000	Extremely Strong

[1] Rock strength grades from Brown (1981).

Three unconfined compressive strength tests were completed on selected rock core samples. The unconfined compressive strength of the rock cores ranged from 6,932 psi to 25,919 psi with an average value of 19,384 psi. The results of point load tests indicate the Point Load Index ($I_{S(50)}$) of the basalt ranged between approximately 268 psi and 714 psi, with an average value of 508 psi. Depth to rock at each exploration is summarized in Table 5-2. The depth to bedrock is also included on the geologic cross sections shown in Figures 3A through 3F.

Table 5-2. Depth of Fill / Depth to Rock Summary

Exploration ID	Associated Structure(s)	Ground Surface Elevation (feet)	Depth to Rock (feet)	Rock Surface Elevation (feet)
B-1	--	516.5	2.5	514.0
B-2	SC90 WAS Pump Station	518.3	16.5	501.8
B-3	Primary Clarifier	529.9	11	518.9
B-4	Building A – O&M & Controls	538.6	4.5	534.1
B-5	MEB Building	528.8	8.5	520.3
P-01	--	517.3	11	506.3
P-02	--	526.1	11.5	514.6
P-03	Primary Clarifier	530.4	16	514.4
P-04	Building A – Headworks & Dewatering	530.8	7.5	523.3
P-05	Building A – Headworks & Dewatering	533.1	3.5	529.6
P-06	Building A – O&M & Controls	536.2	3.5	532.7
P-07	--	538.0	2.5	535.5
P-08	Building A – O&M & Controls	535.3	7.5	527.8
P-09	--	530.5	4	526.5
P-10	--	530.1	5.5	524.6
P-11	MEB Building	529.8	5.5	524.3
P-12	MEB Building	526.4	5	521.4
P-13	Future Aeration Basin No. 4	523.6	8.5	515.1
P-14	Aeration Basin No. 3	521.7	5.5	516.2
P-15	--	519.1	2.5	516.6
P-16	IPS	517.1	12.0	505.1
P-17	--	516.5	6.0	510.5
P-18	SC90, SC60 RAS/WAS Pump Station	518.5	9.0	509.5
P-19	--	518.0	6.0	512.0
P-20	SC90 RAS Pump Station	525.4	8.0	517.4
P-21	Primary Clarifier, Aeration Basin No. 3	521.8	6.0	515.8
P-22	Aeration Basin No. 3	518.5	7.0	511.5
P-23	Primary Clarifier	530.4	15.0	515.4
P-24	MEB Building	529.7	3.0	526.7
P-25	Future Outfall	506.4	2.0	504.4
P-26	Future Outfall	507.2	3.0	504.2
P-27	--	516.6	10.0	506.6
P-28	IPS	516.5	11.0	505.5
P-29	IPS	517.3	12.5	504.8
P-30	SC90	519.8	11.0	508.8
P-31	SC90	520.8	10.0	510.8
P-32	Primary Clarifier, Future Primary Clarifier No. 4	530.4	10.0	520.4
P-33	Future Outfall	529.6	3.5	526.1
P-34	Tertiary Filters	516.9	15.0	501.9
P-35	-	517.5	6.0	511.5
P-36	Sludge Blend Tank, Digested Sludge Holding Tank, Solids Building	516.8	10.8	506.0

5.2 Groundwater

Two-inch diameter, PVC groundwater observation wells were installed in borings B-3 and B-5. Initial groundwater levels recorded on May 2, 2018, with subsequent levels recorded on October 29, 2019, and on June 20, 2022. We also observed groundwater in nine other exploration locations, as summarized in Table 5-3. Groundwater levels are noted on the boring logs in Appendix A.

Groundwater levels may vary with precipitation, the time of year, and/or other factors. Generally, groundwater highs occur near the end of the wet season in late spring and groundwater lows occur near the end of the dry season in the early fall.

Table 5-3. Groundwater Level Measurements

Boring ID	Piezometer	Borehole Elevation (feet)	Depth to Groundwater (feet)			Groundwater Elevation (feet)		
			May 2, 2018	Oct 29, 2019	June 20, 2022	May 2, 2018	Oct 29, 2019	June 20, 2022
B-2	No	518.3	2.5	-	-	515.8	-	-
B-3	Yes	529.9	2.9	3.6	8.2	527.0	526.3	521.7
B-4	No	538.6	2.0	-	-	536.6	-	-
B-5	Yes	528.8	5.0	7.0	6.8	523.8	521.8	522.0
P-03	No	530.4	8.5	-	-	521.9	-	-
P-09	No	530.5	3.0	-	-	527.5	-	-
P-13	No	523.6	6.0	-	-	517.6	-	-
P-15	No	519.1	2.5	-	-	516.6	-	-
P-29	No	517.3	-	-	10.5	-	-	506.8
P-31	No	520.8	-	-	9.2	-	-	511.6
P-32	No	530.4	-	-	9.7	-	-	520.7

6.0 Limitations

This Geotechnical Data Report has been prepared for the City of Sweet Home Mahler Water Reclamation Facility Improvements Project located in Sweet Home, Oregon. This report contains a compilation of information from field explorations, laboratory test data, and published literature. The professional judgments and characterizations presented herein are based on this information. McMillen Jacobs Associates is not responsible for errors and omissions that may appear in the field exploration and laboratory test results performed by others.

It shall be noted that the geotechnical data were obtained at specific exploration locations at specific times. It must be acknowledged that variations in soil/rock conditions exist between exploration locations, and this report does not necessarily reflect the variations between explorations. The nature and extent of variation may not become evident until exposed during construction. No analyses, interpretations between exploration locations, conclusions, or design recommendations are contained in this report. This report should be made available to prospective contractors for use as factual data only, and not as a warranty of subsurface conditions.

The scope of our geotechnical services has not included an environmental evaluation regarding the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below the site, or for evaluation of disposal of contaminated soils or groundwater, should they be encountered.

This report has been completed within the limitations of the agreement between the Owners and West Yost Associates, Inc. and the West Yost Associates, Inc.-approved scope of work, schedule, and budget with McMillen Jacobs Associates. The services rendered have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same area. McMillen Jacobs Associates is not responsible for the use of this report in connection with anything other than the project at the project location.

MCMILLEN JACOBS ASSOCIATES



Wolfe Lang, P.E., G.E.
Principal Geotechnical Engineer

Jeff Quinn, P.E.
Senior Project Engineer

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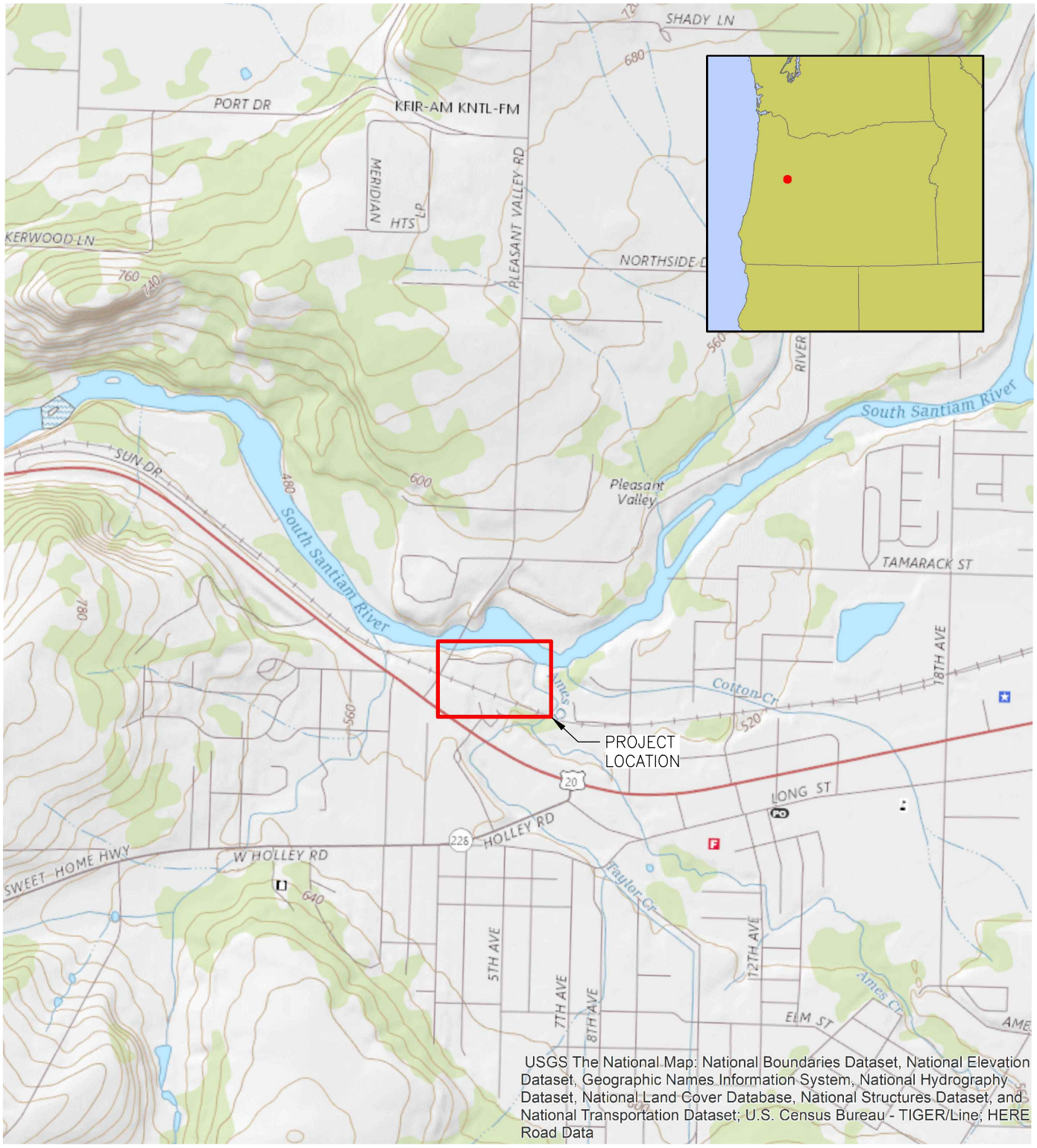
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Popowski, T.A., 1996. Geology, Structure, and Tectonic History if the /Tualatin Basin, Northwestern Oregon: Corvallis, Oregon, Oregon State University Master's Thesis.

Schlicker, H.G. and Deacon, R.J., 1967. Engineering Geology of the Tualatin Valley Region, Oregon: Oregon Department of Geology and Mineral Industries Bulletin 60.

Wilson, D.C., 1998, Post-middle Miocene geologic evolution of the Tualatin basin, Oregon: Oregon Geology, v. 60, no. 5, p. 99-116.

Figures



PROJECT VICINITY MAP

SCALE: NTS

N

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

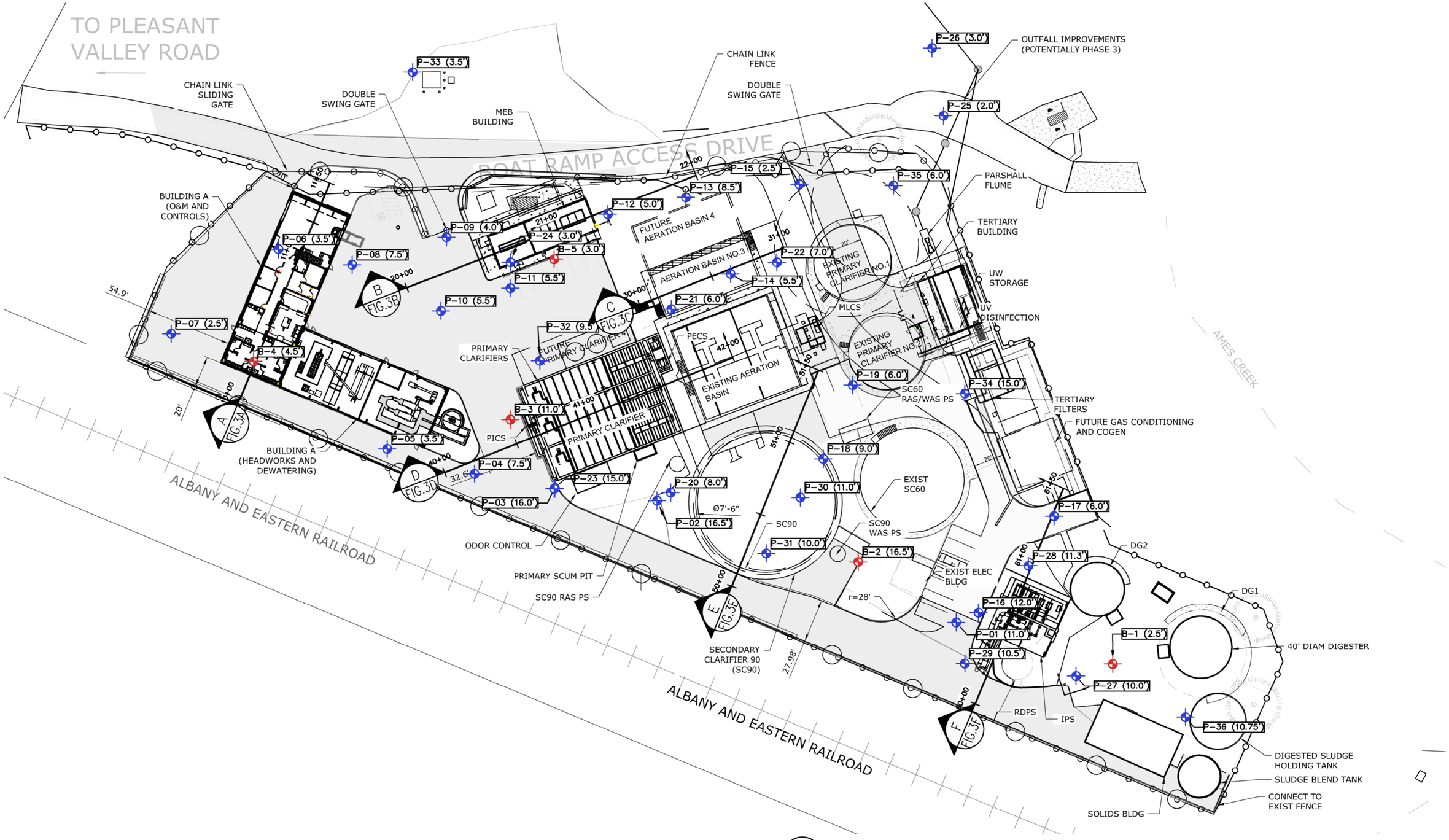
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
PROJECT VICINITY MAP

FIG.1

DEC 2022

Path: C:\Users\cburke\Box\Jobs\636 7.0 Sweet Home WWTP Final Design Review\900 Design Technology\970_Xrefs\Fig.1 – Vicinity map.dwg Plot date: Jul 21, 2022, CAD User: cburke



LEGEND:

B–1 (XX.X') BOREHOLE LOCATION (DEPTH TO ROCK IN FT)

P–01 (XX.X') PROBE–HOLE LOCATION (DEPTH TO ROCK IN FT)

EXPLORATION PLAN

SCALE: 1"=60'

0' 60' 120'

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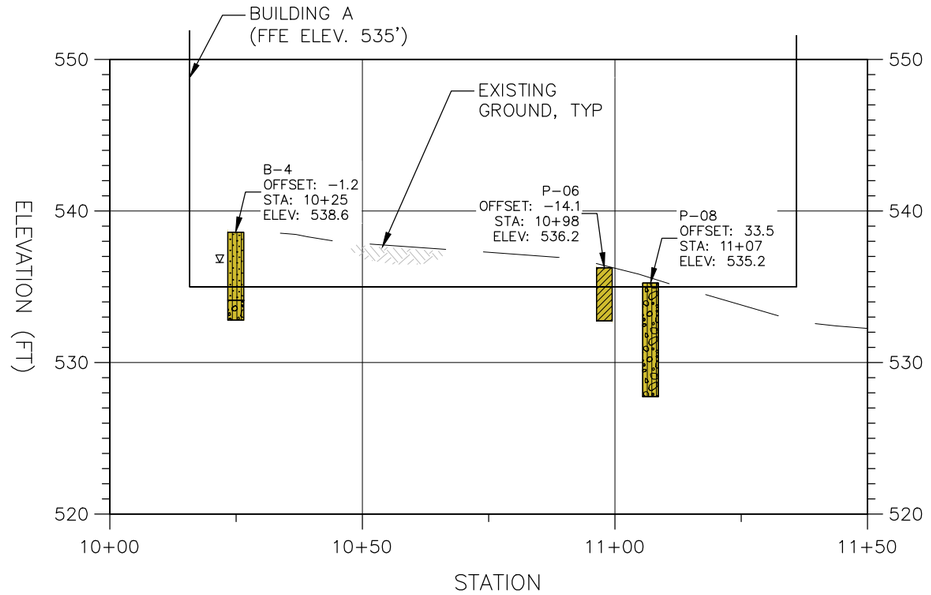
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
EXPLORATION PLAN

FIG.2

DEC 2022

Path: C:\Users\HughanMcdeleine\Box\Jobs\63677.0 Sweet Home WWTP Final Design Review\900 Design Technology\970_Xrefs\SITE PLAN.dwg Plot date: Dec 14, 2022, CAD User: HughanMadeleine



GEOLOGIC PROFILE STA 10+00 TO 11+50

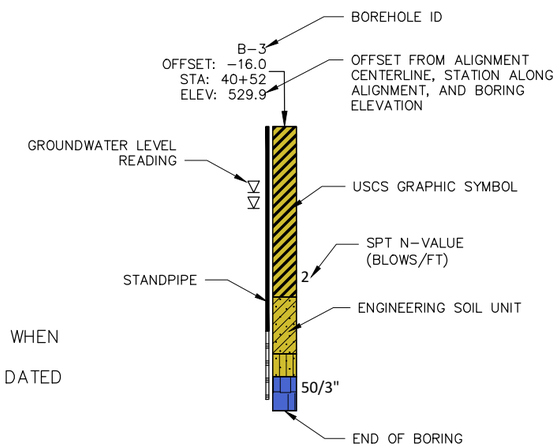
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

1. BOREHOLE LOCATIONS ARE APPROXIMATE.
2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

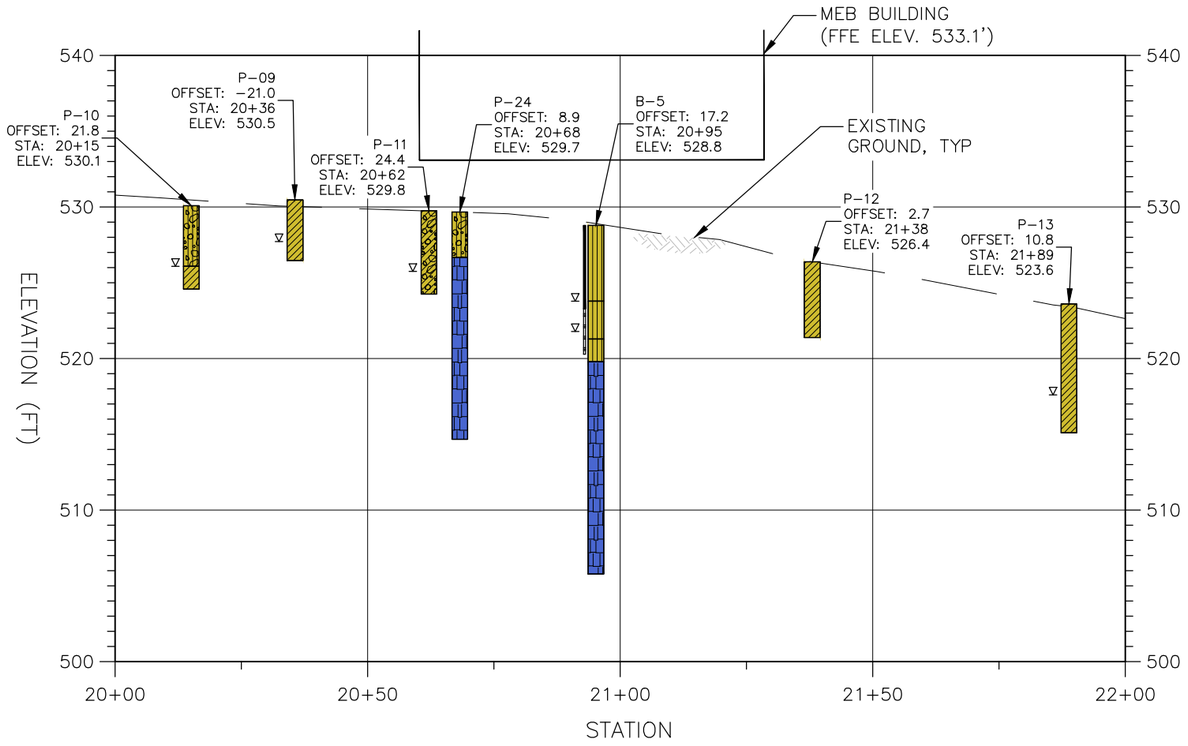
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
BUILDING A

FIG.3A

DEC 2022

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GEOLOGIC PROFILE STA 20+00 TO 22+00

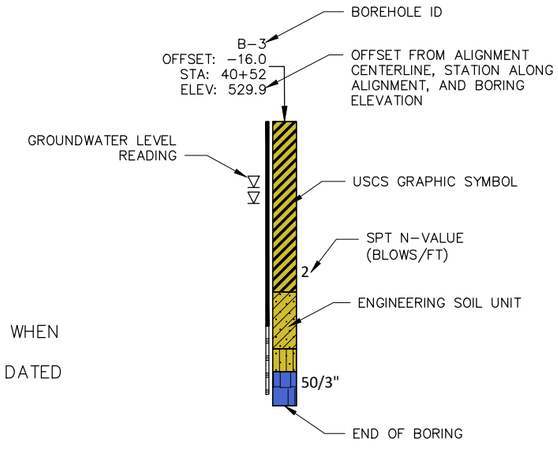
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

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- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
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McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

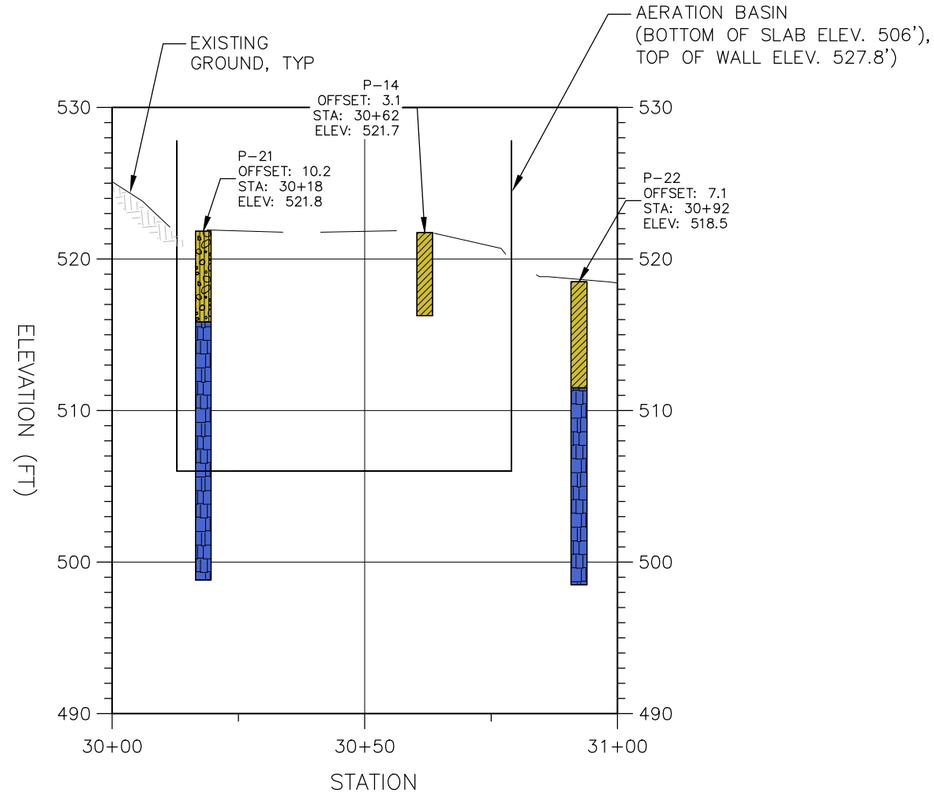
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
MEB BUILDING

FIG.3B

DEC 2022

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GEOLOGIC PROFILE STA 30+00 TO 31+00

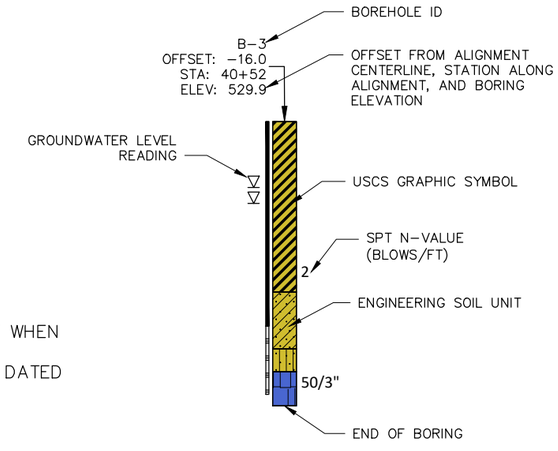
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
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McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

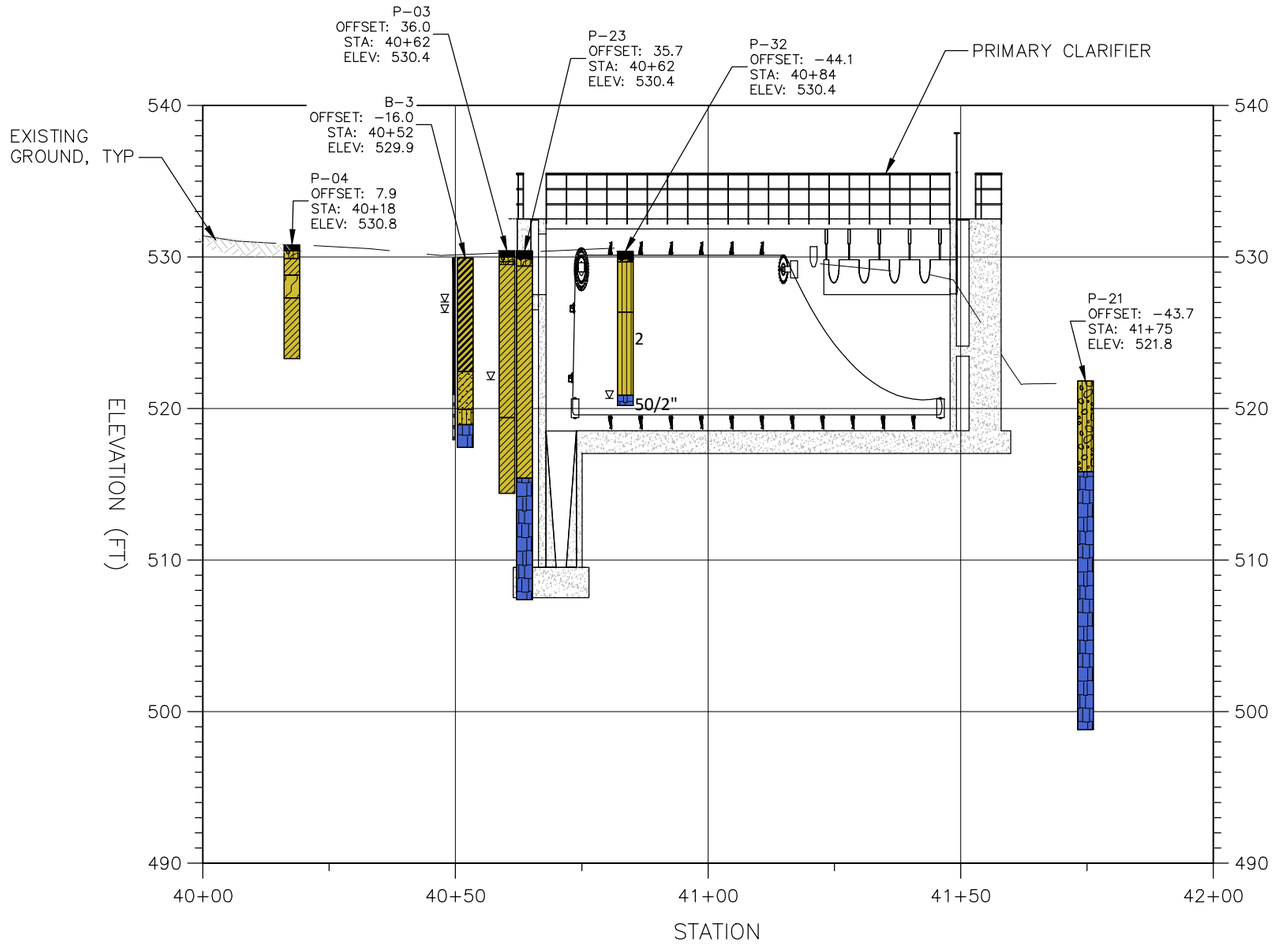
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
AERATION BASIN NO. 3

FIG.3C

DEC 2022

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GEOLOGIC PROFILE STA 40+00 TO 42+00

SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

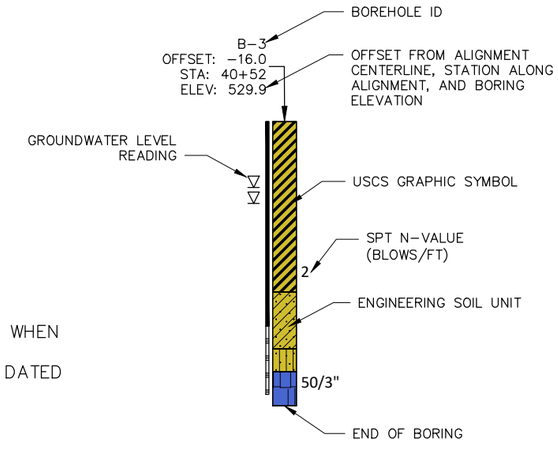
STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
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BORING/PROBE-HOLE LEGEND:



McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

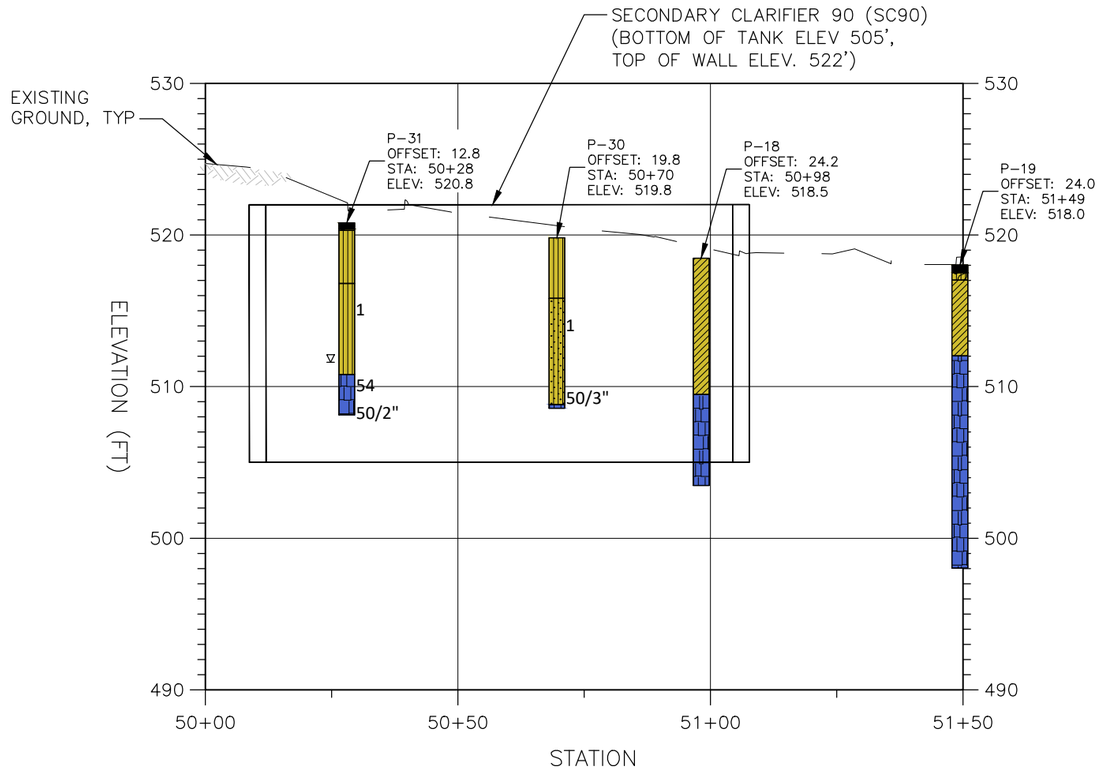
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
PRIMARY CLARIFIER

FIG.3D

DEC 2022

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GEOLOGIC PROFILE STA 50+00 TO 51+50

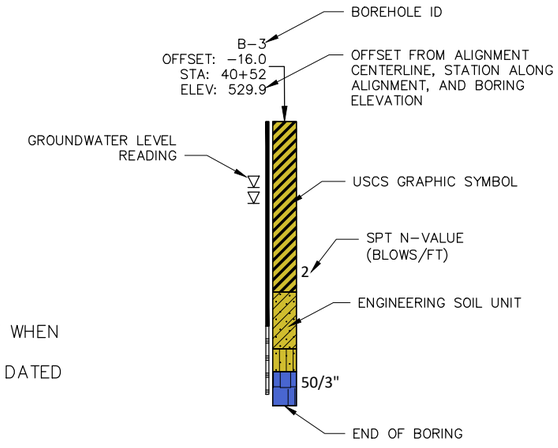
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

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- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
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McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

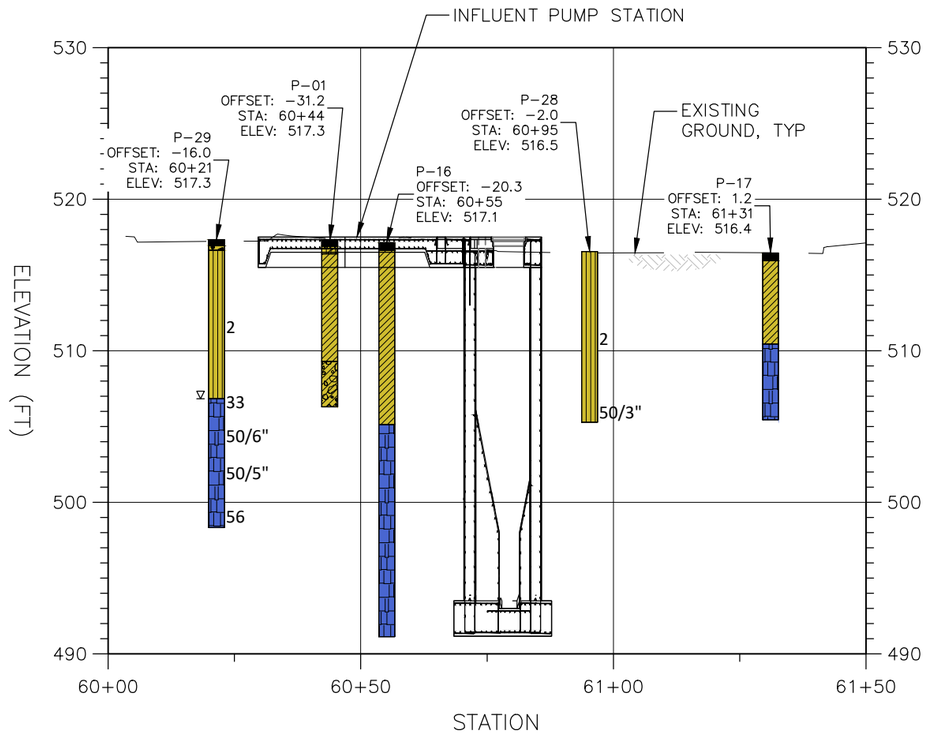
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
SECONDARY CLARIFIER 90 (SC90)

FIG.3E

DEC 2022

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GEOLOGIC PROFILE STA 60+00 TO 61+50

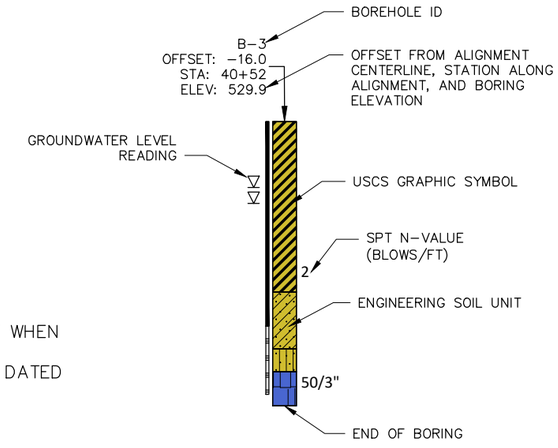
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

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- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
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McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
INFLUENT PUMP STATION

FIG.3F

DEC 2022

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Appendix A

Boring Logs

McMILLEN JACOBS ASSOCIATES

Key to Log of Borings and Descriptive Terms for Soils
Project: 5834.0 Sweet Home WWTP Schematic Design
Sweet Home, OR

Soil Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS Based on ASTM D2488 & D2487)					
MAJOR DIVISIONS			GROUP/SYMBOL		TYPICAL DESCRIPTION
COARSE-GRAINED SOILS (50% or more retained on No. 200 sieve)	GRAVELS (more than 50% retained on No. 4 sieve)	CLEAN GRAVELS (less than 5% fines)	GW		WELL-GRADED GRAVEL
			GP		POORLY GRADED GRAVEL
		GRAVELS (with 5 to 12% fines)	GW-GM		WELL-GRADED GRAVEL WITH SILT
			GW-GC		WELL-GRADED GRAVEL WITH CLAY
			GP-GM		POORLY GRADED GRAVEL WITH SILT
			GP-GC		POORLY GRADED GRAVEL WITH CLAY
		GRAVELS WITH FINES (more than 12% fines)	GM		SILTY GRAVEL
			GC		CLAYEY GRAVEL
	SANDS (less than 50% retained on No. 4 sieve)	CLEAN SANDS (less than 5% fines)	SW		WELL-GRADED SAND
			SP		POORLY GRADED SAND
		SANDS (with 5 to 12% fines)	SW-SM		WELL-GRADED SAND WITH SILT
			SW-SC		WELL-GRADED SAND WITH CLAY
			SP-SM		POORLY GRADED SAND WITH SILT
			SP-SC		POORLY GRADED SAND WITH CLAY
		SANDS WITH FINES (more than 12% fines)	SM		SILTY SAND
			SC		CLAYEY SAND
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS & CLAYS (liquid limit less than 50)	INORGANIC	ML		SILT
			CL		LEAN CLAY
		ORGANIC	OL		LOW PLASTICITY ORGANIC CLAY
	SILTS & CLAYS (liquid limit greater than 50)	INORGANIC	MH		ELASTIC SILT
			CH		FAT CLAY
		ORGANIC	OH		HIGH PLASTICITY ORGANIC CLAY
	SILT/CLAY (liquid limit between 12 and 25)	INORGANIC	CL-ML		CLAYEY SILT / SILTY CLAY
HIGHLY ORGANIC SOILS	PRIMARILY ORGANIC MATTER		PT		PEAT

Notes:

1. Dual symbols (symbols separated by a hyphen, e.g. SP-SM, slightly silty fine SAND) are used for soils between 5% and 12% fines or when liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

Moisture Content

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water, usually from below water table.

Gradation

Gradation	Description
Well-Graded	Approximately equal amounts of all grain sizes
Poorly Graded	Predominately one size (uniformly graded) or a wide range of sizes with a missing intermediate size (gap-graded)

Grain Size

Term	Grain Size	Example
Boulder	Greater than 12" (30cm)	Basketball or Larger
Cobble	3" - 12" (75mm - 30cm)	Fist to Basketball
Gravel Coarse	¾" - 3" (20mm - 75mm)	Thumb to Fist Sized
Gravel Fine	No. 4 Sieve - ¾" (5mm - 20mm)	Pea to Thumb Sized
Sand Coarse	No. 10 Sieve - No. 4 Sieve (2mm - 5mm)	Rock Salt to Pea Sized
Sand Medium	No. 40 Sieve - No. 10 Sieve (0.4mm - 2mm)	Sugar to Rock Salt
Sand Fine	No. 200 sieve - No. 40 sieve (0.08mm - 0.4mm)	Flour to Sugar
Fines	Passing No. 200 Sieve (0.08mm)	Grains Not Visible

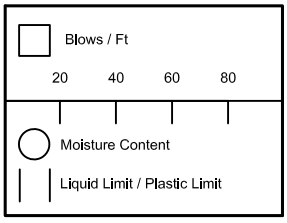
Relative Consistency

Fine - Grained Soils	
Relative Density	N, SPT Blows/Foot
Very Soft	< 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	> 30

Criteria for Describing Plasticity

Description	Criteria
Nonplastic	A ⅛" (3mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

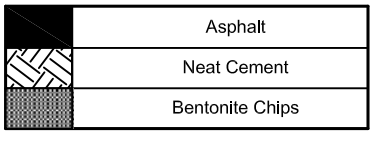
Test Symbols



Relative Density

Coarse - Grained Soils	
Relative Density	N, SPT Blows/Foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

Backfill Symbols



High/Low Water Level Screened Well Interval



McMILLEN JACOBS ASSOCIATES

Key to Boring Logs - Rock

Rock Strength

Description	Recognition	Uniaxial Compressive Strength (psf)
Extremely Weak Rock	Indented by thumbnail	30 to 150
Very Weak Rock	Peeled by pocket knife	150 to 700
Weak Rock	Peeled with difficulty by pocket knife	700 to 3,600
Moderately Strong Rock	Indented 5 mm with sharp end of pick	3,600 to 7,200
Strong Rock	One hammer blow to fracture	7,200 to 14,500
Very Strong Rock	Many hammer blows to fracture	14,500 to 36,000
Extremely Strong Rock	Only chipped by hammer blows	> 36,000

Core Recovery Calculation (%)

$$\frac{\Sigma \text{ Length of recovered core}}{\text{Total Length of core run}} \times 100$$

RQD Calculation (%)

$$\frac{\Sigma \text{ Length of core pieces} > 4 \text{ in.}}{\text{Total Length of core run}} \times 100$$

Rock Weathering

Residual Soil	Entirely decomposed to secondary minerals; material can be easily broken by hand
Completely Weathered	Almost entirely decomposed to secondary minerals; material can be granulated by hand
Highly Weathered	More than half of the rock is decomposed
Moderately Weathered	Rock is discolored and noticeably weakened, but less than half is decomposed
Slightly Weathered	Rock is slightly discolored, but not noticeably lower in strength than fresh rock
Fresh	Rock shows no discoloration, loss of strength, or other effect of weathering or alteration

Discontinuity Type

J	Joint
FJ	Joint along foliation
S	Shear
F	Fault
HJ	Healed joint
MB	Mechanical break
B	Joint along bedding

Rock Fracture Spacing

Extremely Close Spacing	Fractures spaced less than 1 inch apart
Very Close Spacing	Fractures spaced 1 to 2.5 inches apart
Close Spacing	Fractures spaced 2.5 to 8 inches apart
Moderate Spacing	Fractures spaced 8 inches to 2 feet apart
Wide Spacing	Fractures spaced 2 to 6.5 feet apart
Very Wide Spacing	Fractures spaced 6.5 to 20 feet apart
Extremely Wide Spacing	Fractures spaced greater than 20 feet apart

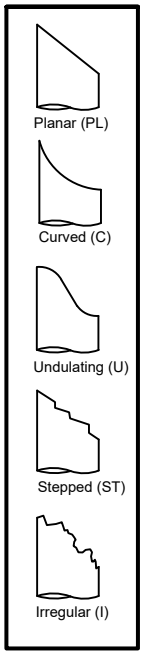
Sample Symbols

	HQ3 Rock Coring

Lithology Graphics

Basalt  Core Loss/ No Recovery 

Fracture Shape



Surface Roughness

Slickensided	Surface has smooth, glassy finish with visual evidence of striations
Smooth	Surface appears smooth and feels so to the touch
Slightly Rough	Asperities on discontinuity surfaces are distinguishable and can be felt
Rough	Ridges and side-angle steps are evident, surface feels very abrasive
Very Rough	Near vertical steps and ridges occur on discontinuity surface

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-1

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary and HQ Wireline/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **13.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **516.5 ft**	
Location: **Survey**	Coordinates: **7617396.39 E, 275319.73 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete - 18" thick (Pavement)		
							GM	Dense, moist, gray Silty Gravel (GM); Fine to coarse angular gravel, low plasticity silt (Base Aggregate)		At 2.5 feet very slow, very rough drilling. At 3.5 feet switch to rock coring.
512 / 5		100	RUN 1					BASALT, very strong (R5), slightly weathered to fresh, moderately to highly fractured, planar, stepped, smooth to rough joints with very narrow apertures (Little Butte Volcanic Series - Tholeiitic Basalt) *Run 1: 3.5-8.5 feet.* *RQD = 59%*		From 5.20 feet to 6.30 feet, UCS = 25,300 psi.
507 / 10		80	RUN 2					*Run 2: 8.5 -13.5 feet:* *RQD = 42%* *Planar and irregular, smooth to slightly rough joints.*		
502 / 15										Borehole completed at 13.5ft. below ground surface (bgs).
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring B-1

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-2

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **16.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **518.2 ft**	
Location: **Survey**	Coordinates: **7617232.28 E, 275385.44 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514							OL/ OH	Organic Soil (OL/OH); Mulch (Fill)		
5/2/2018 1▼		47	S1	7-5-11 (N=16)			CL	Very stiff, moist, brown to gray brown, Sandy LEAN CLAY with Gravel (CL); Medium plasticity, medium to low toughness, fine to coarse sand, fine angular gravel (Fill)		
5		27	S2	2-4-4 (N=8)			SM	Loose, moist to wet, brown, Silty SAND with Gravel (SM); Fine to coarse sand, fine angular gravel, medium plasticity, slow dilatancy (Fill)		
		53	S3	2-3-1 (N=4)				Very loose, wet, brown, Silty SAND (SM); Fine to medium sand, low plasticity fines, rapid dilatancy (Fill)		
509										
10		73	S4	2-0-0 (N=WOR)			SM	*At 10.0 grades to orange-brown, occurrence of trace, fine, angular gravel, and slow dilatancy.*		
		33	S5	0-0-1 (N=1)						
504										
15		100	S5	17-18-27 (N=45)			GC	Very dense, moist, gray and olive-brown, CLAYEY GRAVEL with Sand (GC); Fine to coarse angular gravel, fine to coarse sand, medium plasticity fines (Fill)		Borehole completed at 16.5ft. below ground surface (bgs).
499										
20										
494										
25										
489										
30										

McMILLEN JACOBS ASSOCIATES

Boring B-2

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-3

Date(s) Drilled: **05/02/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **12.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **529.9 ft**	
Location: **Survey**	Coordinates: **7617007.93 E, 275477.18 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 5		53	S1	3-2-1 (N=3)			CH	Soft, moist, gray with trace orange mottles, Sandy FAT CLAY (CH); High plasticity, medium toughness, fine sand, occasional organics (Fill)		
		60	S2	0-1-1 (N=2)				*At 5.0 feet grades to scattered woody organics.*		
		100	S3	1-1-1 (N=2)			SC	Very loose, moist to wet, gray, CLAYEY SAND (SC); Fine to medium sand, medium plasticity and medium toughness fines, occasional 1-inch sandy lenses of slow dilatancy (Fill)		
520 / 10		87	S4	0-16-49 (N=65)			SM	Medium dense, wet, red-brown, SILTY SAND (SM); Fine to medium sand, low plasticity fines, slow dilatancy (Fill)		
		0	S5	50/0" (Refusal)				Dark gray basalt chips in cuttings (Little Butte Volcanic Series - Tholeiitic Basalt)		At 11.0 feet very rough , very slow drilling.
515 / 15										Borehole completed at 12.5ft. below ground surface (bgs).
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring B-3

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-4

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.8 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **538.6 ft**	
Location: **Survey**	Coordinates: **7616842.35 E, 275514.57 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
534 5/2/2018 1		20	S1	7-10-7 (N=17)			SM	Medium dense, moist to wet, dark gray, SILTY SAND with Gravel (SM); Fine to medium sand, fine angular gravel, low plasticity fines, slow dilatancy, scattered organics (Fill)		
5		120	S2	28-50/3" (Refusal)			GM	Very dense, moist, gray and orange, SILTY GRAVEL with Sand (GM); Fine to coarse gravel, fine to coarse sand, medium plasticity fines (Fill)		At 4.5 feet very slow, very rough drilling.
529 10										Borehole completed at 5.8ft. below ground surface (bgs).
524 15										
519 20										
514 25										
509 30										

McMILLEN JACOBS ASSOCIATES

Boring B-4

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-5

Date(s) Drilled: **05/02/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary and HQ Wireline/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **528.8 ft**	
Location: **Survey**	Coordinates: **7617036.16 E, 275580.52 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
524 / 5		53	S1	1-5-6 (N=11)			ML	Stiff, moist, gray, Sandy SILT (ML); Low plasticity, medium toughness, fine sand, trace coarse sand, occasional organics (Fill)		
		53	S2	1-1-1 (N=2)			ML	Soft, moist to wet, green to red-brown, Sandy SILT (ML); Low plasticity, low toughness, fine to medium sand, occasional organics (Fill)		
10/29/2015 11:2016 1		73	S3	1-4-11 (N=15)			ML	Stiff, wet, gray and red-brown, Sandy SILT (ML); Low plasticity, medium toughness fines, fine sand, trace medium and coarse sand, occasional organics (Fill)		At 8.5 feet, more difficulty drilling, driller remarks likely weathered rock.
519 / 10		100	RUN 1					Run 1: 9.0 - 13.0 feet, RQD = 75%; BASALT, very strong (R5), slightly weathered to fresh, moderately to highly fractured, planar and curved, smooth to rough, high angle and sub-horizontal narrow joints (Little Butte Volcanic Series - Tholeiitic Basalt)		At 9.0 feet, switch to rock coring. RQD = 75%. From 11.7 feet to 12.4 feet UCS = 29,919 psi.
								Run 2: 13.0-18.0 feet, RQD = 86%, addition of irregular joints and < 0.1" thick light blue green staining/coating of occasional joints.		At 13.0 feet RQD = 86%.
514 / 15		100	RUN 2							
								Run 3: 18.0-23.0 feet, RQD = 74%, grade to medium strong based on testing		At 18.0 feet RQD = 74%. From 18.0 feet to 19.0 feet UCS = 6,932 psi.
509 / 20		100	RUN 3							
504 / 25										Borehole completed at 23ft. below ground surface (bgs).
499 / 30										

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Boring B-5

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-01

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **517.3 ft**	
Location: **Survey**	Coordinates: **7617295.47 E, 275346.48 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Dense, gray, Silty GRAVEL (GM); (Base Aggregate)		
513 / 5			S1				CL	Very soft to soft, moist, brown, LEAN CLAY with Sand (CL); Low plasticity, medium toughness, fine sand, trace medium sand, occasional organics (Fill)		At 9.0 feet driller remarks that the material stiffens.
508 / 10							GC	Very loose to loose, moist to wet, gray brown, CLAYEY GRAVEL with Sand (GC); Fine to coarse angular basalt gravel, fine to coarse sand, low plasticity fines (Fill)		At 10.0 feet, driller remarks that the material feels like rock but the auger is able to continue to spin. Auger refusal at 11 feet.
503 / 15										Borehole completed at 11ft. below ground surface (bgs).
498 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
493 / 25										
488 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-01

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-02

Date(s) Drilled: **05/01/2018 - 01/05/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **526.1 ft**	
Location: **Survey**	Coordinates: **7617102.54 E, 275424.97 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
522 / 5							CL	Soft to very soft, moist, brown to light brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine angular gravel, occasional organics (Fill)		At 2.5 feet very slow, very rough drilling.
517 / 10										Auger refusal at 11.5 feet.
512 / 15										Borehole completed at 11.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
507 / 20										
502 / 25										
497 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-02

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-03

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **16.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.4 ft**	
Location: **Survey**	Coordinates: **7617036.27 E, 275432.54 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 / 0							GM	Asphalt (Pavement) Base rock (Fill) Very soft to soft, moist, dark gray-brown, LEAN CLAY with Sand (CL); Fine sand (Fill)		
5							CL			
4/30/2018 ▼										
521 / 10							CL	Very soft to soft, moist to wet, gray, Sandy LEAN CLAY (CL); Medium plasticity, fine to medium sand (Fill) *At 13.0 feet, grades to brown, moist to wet, decrease in sand content.*		
516 / 15										Auger refusal at 16 feet.
										Borehole completed at 16ft. below ground surface (bgs).
511 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
506 / 25										
501 / 30										

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Boring P-03

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-04

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **7.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.8 ft**	
Location: **Survey**	Coordinates: **7616984.89 E, 275442.28 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
							GM	Dense, moist, gray Silty GRAVEL (GM); Fine to coarse angular gravel, low plasticity silt, 5 inches thick (Base Aggregate)		
							CL			
			S1				OL/ OH	Very soft to soft, moist, dark gray-brown, LEAN CLAY (CL); (Fill)		At 2.5 feet driller remarks that material becomes stiffer, woody material began smoking so driller added water to hole, very slow drilling. Organic chemical odor in the wood fiber of Sample 1.
526								Hard, moist, brown, Organic Soil with Sand (OL/OH); Frequent hard wood in clay (Fill)		
5								Very soft to soft, moist, green-brown with brown-orange mottles, LEAN CLAY (CL); Low plasticity, fine sand, trace medium sand (Fill)		
			S2				CL			Auger refusal at 7.5 feet.
521										Borehole completed at 7.5ft. below ground surface (bgs).
10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
516										
15										
511										
20										
506										
25										
501										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-04

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-05

Date(s) Drilled: **05/01/2018 - 05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **3.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **533.1 ft**	
Location: **Survey**	Coordinates: **7616928.58 E, 275458.29 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							CL	Very soft to soft, moist, brown to light brown, LEAN CLAY with Sand (CL); Low plasticity, medium toughness, fine sand, trace coarse angular gravel, occasional organics (Fill)		Auger refusal at 3.5 feet.
529 / 5										Borehole completed at 3.5ft. below ground surface (bgs).
524 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
519 / 15										
514 / 20										
509 / 25										
504 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-05

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-06

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **3.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **536.2 ft**	
Location: **Survey**	Coordinates: **7616858.52 E, 275586.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
			S1				CL	Stiff, moist to wet, brown, LEAN CLAY (CL); Low plasticity, medium toughness, trace fine to medium sand, fine gravel, occasional woody organics (Fill)		Auger refusal at 3.5 feet.
532 / 5										Borehole completed at 3.5ft. below ground surface (bgs).
527 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
522 / 15										
517 / 20										
512 / 25										
507 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-06

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-07

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **2.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **538.0 ft**	
Location: **Survey**	Coordinates: **7616789.32 E, 275532.46 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Very loose to loose, moist, dark brown, SILTY GRAVEL with Sand (GM); Angular fine to coarse gravel with cobbles, low plasticity fines (Fill)		Auger refusal at 2.5 feet.
533 5										Borehole completed at 2.5ft. below ground surface (bgs).
528 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
523 15										
518 20										
513 25										
508 30										

McMILLEN JACOBS ASSOCIATES

Boring P-07

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-08

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **7.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **535.2 ft**	
Location: **Survey**	Coordinates: **7616905.96 E, 275577.01 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
531 / 5			S1				GM	Very loose to loose, moist, dark brown, SILTY GRAVEL with Sand (GM); Fine to coarse angular to subangular gravel, fine to coarse sand, low plasticity fines, occasional woody organics (Fill)		Slight petroleum odor while drilling. Auger refusal at 7.5 feet.
526 / 10										Borehole completed at 7.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
521 / 15										
516 / 20										
511 / 25										
506 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-08

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-09

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **4.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.5 ft**	
Location: **Survey**	Coordinates: **7616966.80 E, 275594.59 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 5/2/2018 ▼ 5			S1				CL	Moist, gray-brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel, scattered organics (Fill)		Slight petroleum odor. Auger refusal at 4 feet.
										Borehole completed at 4ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
521 10										
516 15										
511 20										
506 25										
501 30										

McMILLEN JACOBS ASSOCIATES

Boring P-09

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-10

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.1 ft**	
Location: **Survey**	Coordinates: **7616963.18 E, 275547.22 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 0							GM	Very loose to loose, moist, brown, SILTY GRAVEL with Sand (GM); Fine to coarse gravel, fine and coarse sand, low plasticity. (Fill)		
5/1/2018 1							CL	Very soft to soft, wet, gray-brown, LEAN CLAY with Sand (CL); Low plasticity, fine sand, trace angular fine angular gravel. (Fill)		Auger refusal at 5.5 feet.
521 5										Borehole completed at 5.5ft. below ground surface (bgs).
516 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
511 15										
506 20										
501 25										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-10

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-11

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **529.8 ft**	
Location: **Survey**	Coordinates: **7617007.94 E, 275561.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 5			S1				GC	Very loose to loose, moist to wet, brown to gray brown, Clayey GRAVEL with Sand (GC); Fine to coarse gravel, fine to coarse sand (Fill)		Auger refusal at 5.5 feet.
520 10										Borehole completed at 5.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
515 15										
510 20										
505 25										
500 30										

5/1/2018 1

McMILLEN JACOBS ASSOCIATES

Boring P-11

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-12

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **526.4 ft**	
Location: **Survey**	Coordinates: **7617070.84 E, 275609.56 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
522 / 5			S1				CL	Very soft to soft, moist, brown, Gravelly LEAN CLAY with Sand (CL); Low plasticity, fine to coarse angular gravel, fine to coarse sand (Fill)		Auger refusal at 5 feet.
517 / 10										Borehole completed at 5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
512 / 15										
507 / 20										
502 / 25										
497 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-12

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-13

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **8.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **523.6 ft**	
Location: **Survey**	Coordinates: **7617121.16 E, 275620.34 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
519 / 0							CL	Very soft to soft, moist to wet, dark brown to gray brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel (Fill)		Loose gravelly material begins caving at the ground surface.
5/6/2018 1										Auger refusal at 8.5 feet.
514 / 5										Borehole completed at 8.5ft. below ground surface (bgs).
509 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
504 / 15										
499 / 20										
494 / 25										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-13

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-14

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **521.7 ft**	
Location: **Survey**	Coordinates: **7617149.97 E, 275571.01 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
517 / 5			S1				CL	Very soft to soft, wet, gray-brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel (Fill)		Observed groundwater at approximately 4.0 feet water present, difficult to measure due to gravel.
512 / 10										Auger refusal at 5.5 feet.
507 / 15										Borehole completed at 5.5ft. below ground surface (bgs).
502 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
497 / 25										
492 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-14

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-15

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **2.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **519.1 ft**	
Location: **Survey**	Coordinates: **7617194.34 E, 275628.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
519 0							GC	Very loose to loose, moist to wet, brown, CLAYEY GRAVEL with Sand (GC); Fine angular gravel, fine to coarse sand (Fill)		Auger refusal at 2.5 feet.
4/30/2018 ▽										Borehole completed at 2.5ft. below ground surface (bgs).
515 5										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
510 10										
505 15										
500 20										
495 25										
490 30										

McMILLEN JACOBS ASSOCIATES

Boring P-15

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-16

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **26.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **517.1 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617309.79 E, 275352.81 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
513 / 5								Asphalt (Pavement) Soft, moist, brown, CLAY (CL) (Fill)		
							CL			
508 / 10										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
503 / 15										
498 / 20										
493 / 25										
										Borehole completed at 26ft. below ground surface (bgs).
488 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-16

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-17

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **11.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **516.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617358.56 E, 275414.92 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
								Soft, moist, brown, CLAY (CL) (Fill)		
							CL			
512 5										
								Basalt, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
507 10										
										Borehole completed at 11ft. below ground surface (bgs).
502 15										
497 20										
492 25										
487 30										

McMILLEN JACOBS ASSOCIATES

Boring P-17

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-18

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.5 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617209.77 E, 275451.86 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514 / 5							CL	Soft, moist, brown, CLAY (CL) (Fill)		
509 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
504 / 15										Borehole completed at 15ft. below ground surface (bgs).
499 / 20										
494 / 25										
489 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-18

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-19

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.0 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617228.61 E, 275499.48 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
								Soft, moist, brown, CLAY (CL) (Fill)		
514							CL			
5										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
509										
10										
504										
15										
499										
20										Borehole completed at 20ft. below ground surface (bgs).
494										
25										
489										
30										

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-20

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **525.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617111.38 E, 275430.15 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
521 / 5							CL	Soft, moist, brown, CLAY (CL) (Fill)		
516 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
511 / 15										
506 / 20										Borehole completed at 20ft. below ground surface (bgs).
501 / 25										
496 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-20

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-21

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **521.8 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617111.78 E, 275548.31 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
517 / 5							GM	Loose, gray, silty GRAVEL (GM) (Fill)		
512 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
507 / 15										
502 / 20										
497 / 25										Borehole completed at 23ft. below ground surface (bgs).
492 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-21

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-22

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.5 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617179.82 E, 275578.51 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514 / 5							CL	Soft, moist, brown, slightly sandy CLAY (CL) (Fill)		
509 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
504 / 15										
499 / 20										Borehole completed at 20ft. below ground surface (bgs).
494 / 25										
489 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-22

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-23

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **530.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617036.68 E, 275432.95 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, slightly silty GRAVEL (GM) (Fill)		
								Soft, moist, brown, CLAY (CL) (Fill)		
526 / 5							CL			
521 / 10										
516 / 15								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
511 / 20										There was no return of rock chips until 22 feet bgs. Driller commented that the hole was being plugged by dirt and preventing return of rock fragments.
506 / 25										Borehole completed at 23ft. below ground surface (bgs).
501 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-23

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-24

Date(s) Drilled: **10/30/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **529.7 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617008.03 E, 275578.53 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 0							GM	Loose, gray, silty GRAVEL (GM) (Fill)		
525 / 5								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		Driller commented that it got wet around 5 feet bgs.
520 / 10										
515 / 15										Borehole completed at 15ft. below ground surface (bgs).
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-24

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-25

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **506.4 ft**	
Location: **Pleasant Valley Boat Ramp**	Coordinates: **7617287.27 E, 275672.91 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
502								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
5										
497										
10										
492										
15										Borehole completed at 15ft. below ground surface (bgs).
487										
20										
482										
25										
477										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-25

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-26

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **507.2 ft**	
Location: **Pleasant Valley Boat Ramp**	Coordinates: **7617279.85 E, 275716.52 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
503 5								BASALT, fractured, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		Driller comments that between 5 and 12 feet bgs seemed like highly fractured rock.
498 10										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
493 15										
488 20										
483 25										Borehole completed at 23ft. below ground surface (bgs).
478 30										

McMILLEN JACOBS ASSOCIATES

Boring P-26

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-27

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **26.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **516.6 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617372.72 E, 275312.04 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete (Pavement)		
								Soft, moist, brown, slightly sandy CLAY (CL) (Fill)		
512 / 5							CL			
507 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
502 / 15										
497 / 20										
492 / 25										
487 / 30										Borehole completed at 26ft. below ground surface (bgs).

McMILLEN JACOBS ASSOCIATES

Boring P-27

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-28

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 11.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 516.5 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617342.00 E, 275383.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
512 / 5		67	SPT-1	1-1-1 (N=2)			ML	Soft, moist, brown, SILT (ML); low plasticity, trace fine gravel, trace fine sand, trace wood fibers. (Fill)		
		100	G-1					*Becomes gray mottled at 5.5 feet.*		
507 / 10		64	SPT-2	1-7-50/3" (Refusal)				*10 - 11 feet: sample consists of approx. 50% wood fibers by volume.* *Auger refusal at 11.25 feet on basalt bedrock.*		Borehole completed at 11.25ft. below ground surface (bgs).
502 / 15										
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-28

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-29

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 19.0 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 517.3 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617301.00 E, 275320.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
								Base Aggregate - 3" thick (Fill)		
								Soft, moist, brown, SILT (ML); low plasticity, trace fine gravel, trace fine sand, trace wood fibers. (Fill)		
513		100	G-1							
5		20	SPT-1	1-0-2 (N=2)			ML			
		100	G-2							
508										
10		33	SPT-2	0-7-26 (N=33)				*Becomes wet at 10 feet.*		Auger grinding below 10 - 15 feet.
		100	G-3					BASALT; very weak, dark brown, highly weathered to decomposed (Little Butte Volcanic Series - Tholeiitic Basalt)		
		70	SPT-3	50/12" (Refusal)						
503										
15		98	SPT-4	26-50/5" (Refusal)				*Penetration rate decreases significantly at 15 feet; stronger rock inferred below this depth.*		Smooth, slow drilling below 15 feet.
		87	SPT-5	12-23-33 (N=56)				*Becomes dark blue-gray at 18 feet.*		
498										Borehole completed at 19ft. below ground surface (bgs).
20										
493										
25										
488										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-29

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-30

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 11.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 519.8 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617195.00 E, 275427.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
		100	G-1				ML	Moist, light brown, SILT with gravel (ML); low plasticity, fine to coarse angular gravel. (Fill)		
515 / 5		100	SPT-1	1-0-1 (N=1)			SM	Very soft, wet, light brown, Silty SAND (SM); fine to medium sand, low plasticity fines. (Fill)		
510 / 10		40	SPT-2	8-11-50/3" (Refusal)				*Basalt inferred below 11 feet.* *Auger refusal at 11.25 feet on basalt bedrock.*		Borehole completed at 11.25ft. below ground surface (bgs).
505 / 15										
500 / 20										
495 / 25										
490 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-30

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-31

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 12.7 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 520.8 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617173.00 E, 275391.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
								Base Aggregate - 1" thick (Fill)		
							ML	Moist, light brown, SILT with gravel (ML); low plasticity, fine to coarse angular gravel. (Fill)		
516 / 5		33	SPT-1	0-0-1 (N=1)			ML	Very soft, moist to wet, Sandy SILT (ML); fine to medium sand, low plasticity fines. (Fill)		
511 / 10		40	SPT-2	30-38-16 (N=54)				*Basalt inferred below 10 feet.*		Rod chatter begins at 9 feet and increases significantly below 10 feet.
		147	SPT-3	50/2" (Refusal)				*Auger refusal at 12.67 feet on basalt bedrock.*		Borehole completed at 12.67ft. below ground surface (bgs).
506 / 15										
501 / 20										
496 / 25										
491 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-31

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-32

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 10.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 530.4 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617027.00 E, 275515.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 6" thick (Pavement)		
								Base Aggregate - 2" thick (Fill)		
		100	G-1				ML	Moist, dark brown, SILT with gravel (ML); low plasticity, fine to coarse gravel. (Fill)		
526										
5		100	SPT-1	0-1-1 (N=2)			ML	Soft, moist, gray, SILT (ML); low plasticity, trace fine sand. (Fill) *Becomes gray at 4.5 feet.*		
521										Rod chatter below 9.5 feet bgs.
10		47	SPT-2	50/2" (Refusal)				*Auger refusal at 10.17 feet on basalt bedrock.*		Borehole completed at 10.17ft. below ground surface (bgs).
516										
15										
511										
20										
506										
25										
501										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-32

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-33

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 3.7 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 529.6 ft	
Location: See Figure 2 Site Plan	Coordinates: 7616945.00 E, 275701.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 5		100	G-1				GM	Moist, brown, Silty GRAVEL (GM); fine to coarse gravel, non-plastic fines. (Fill)		Strong rod chatter from ground surface to 3.5 feet bgs.
		0	SPT-1	50/2" (Refusal)				*Basalt inferred below 3.5 feet.* *Auger refusal at 3.67 feet on basalt bedrock.*		Auger bit grinding at 3.5 feet. Borehole completed at 3.67ft. below ground surface (bgs).
520 / 10										
515 / 15										
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-33

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-34

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 15.0 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 516.9 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617301.00 E, 275494.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
							GM	Base Aggregate - 2" thick (Fill)		
								Moist, brown, Silty GRAVEL (GM); fine to coarse gravel, low plasticity fines. (Fill)		
		100	G-1					Soft to very soft, moist, brown, SILT (ML); low plasticity, trace fine sand. (Fill)		
512 / 5		40	SPT-1	1-1-3 (N=4)			ML			
507 / 10		33	SPT-2	1-0-1 (N=1)				*Becomes very soft, grades to Silt with sand at 10 feet.*		
502 / 15		100	SPT-3	50/2" (Refusal)				*Auger refusal at 15 feet on basalt bedrock.*		Borehole completed at 15ft. below ground surface (bgs).
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-34

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-35

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 7.1 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 517.5 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617255.00 E, 275628.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Moist, dark gray and brown, Silty GRAVEL (GM); fine to coarse gravel. (Fill)		Rod chatter from ground surface to 5 feet bgs.
							ML	Soft, moist, brown, SILT (ML); low plasticity, trace fine sand. (Fill)		
513 5		60	SPT-1	0-1-2 (N=3)						
		0	SPT-2	50/1" (Refusal)				*Basalt inferred below 6 feet.*		Rod chatter and difficulty anvancing auger below 6 feet.
								Auger refusal at 7.08 feet on basalt bedrock.		Borehole completed at 7.08ft. below ground surface (bgs).
508 10										
503 15										
498 20										
493 25										
488 30										

McMILLEN JACOBS ASSOCIATES

Boring P-35

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-36

Date(s) Drilled: **11/22/2022**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Quinn**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **8.25" Hollow Stem Auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.6 ft**	
Hole Diameter: **8.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **516.77 ft**	
Location: **SE Corner of WWTP Site**	Coordinates: **7617443.00 E, 275286.00 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete - 6" thick (Pavement)		
								Base Aggregate - 6" thick (Fill)		
								Stiff, moist, brown with orange mottling, LEAN CLAY (CL); low to medium plasticity, trace coarse rounded gravel, trace fine sand. (Fill)		
		55	SPT-1	2-8-7 (N=15)						
-5 5								*Becomes medium stiff at 5 feet bgs.*		
		50	SPT-2	2-3-4 (N=7)			CL			
		60	SPT-3	50/5" (Refusal)				*Boulders/cobbles likely from 7.5 to 9.0 feet bgs.*		Slow, difficult drilling from 7.5 to 9 feet bgs.
								Becomes stiff at 9.0 feet bgs.		Drillers cracked auger transfer rod at approximately 8.5 feet bgs. Abandoned original boring at 8.5 feet bgs due to being off vertical alignment and moved about 4 feet west to re-drill boring.
-10 10		100	SPT-4	3-3-9 (N=12)				*Becomes gray with rootlets at 10 feet bgs.*		
								Basalt inferred below 10.75 feet bgs.		Difficult, slow drilling below 10.75 feet bgs. 30 minutes to advance from 10.75 to 11.5 feet bgs.
		800	SPT-5	50/0" (Refusal)						Borehole completed at 11.6ft. below ground surface (bgs).

McMILLEN JACOBS ASSOCIATES

Boring P-36

Appendix B

Rock Core Photos



BOREHOLE B-01, 3.5 TO 13.5 FEET



BOREHOLE B-05, 9.0 TO 16.3 FEET

McMILLEN JACOBS ASSOCIATES	**SWEET HOME WWTP SCHEMATIC DESIGN GEOTECHNICAL DATA REPORT**	**JULY 2022**
	CORE PHOTOGRAPHS	**FIGURE C - 1**



BOREHOLE B-05, 16.3 TO 23 FEET

Appendix C

Laboratory Test Results

Northwest Testing, Inc.
A Division of Northwest Geotech, Inc.
9120 SW Pioneer Court, Suite B, Wilsonville, Oregon 97070 | ph: 503.682.1880 fax: 503.682.2753 | www.nwgeotech.com

TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Report of: Atterberg limits, moisture content, and compressive strength of rock

Sample Identification

NTI completed Atterberg limits, moisture content, and compressive strength of rock testing on samples delivered to our laboratory on May 9, 2018 by a McMillen Jacobs Associates representative. Testing was performed in accordance with the standards indicated. Our laboratory test results are summarized on the following tables and attached pages.

Laboratory Test Results

Atterberg Limits (ASTM D 4318)			
Sample ID	**Liquid Limit**	**Plastic Limit**	**Plasticity Index**
B-3 S-2 @ 5 – 6.5 ft.	51	28	23
B-5 S-1 @ 2.5 – 4 ft.	44	28	16

Moisture Content of Soil (ASTM D 2216)	
Sample ID	**Moisture Content (Percent)**
B-3 S-2 @ 5 – 6.5 ft.	44.8
B-5 S-1 @ 2.5 – 4 ft.	26.3

Copies: Addressee

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TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Laboratory Testing

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-1 R-1 @ 5.2 – 6.3 ft.	2.41	4.88	100	25,302



Photo1: As received sample



Photo 2: Test sample before testing



Photo 3: Test sample after testing

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TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Laboratory Testing

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-5 R-1 @ 11.7 – 12.4 ft.	2.41	4.85	100	25,919



Photo1: As received sample

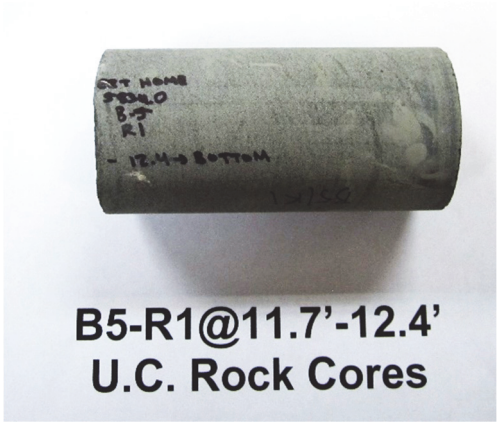


Photo 2: Test sample before testing



Photo 3: Test sample after testing

Laboratory Testing

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TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-5 R-2 @ 18 – 19 ft.	2.41	4.86	100	6932

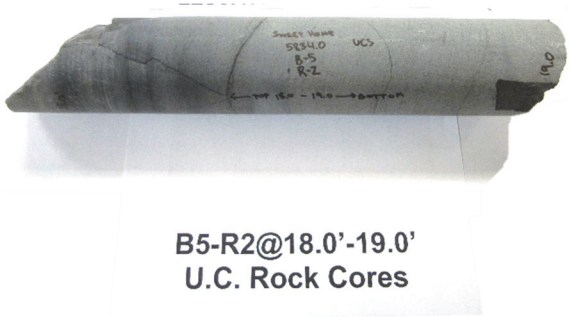


Photo1: As received sample

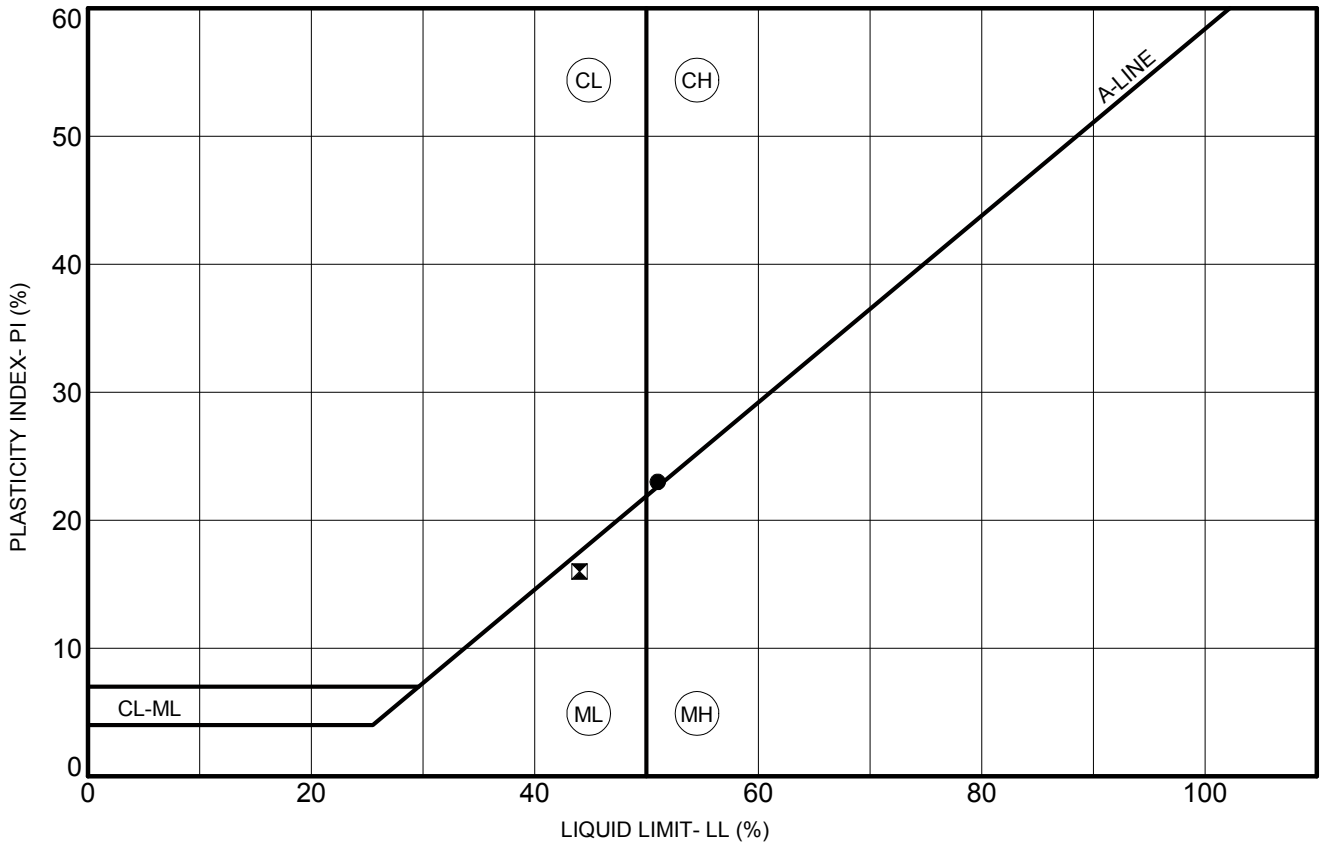


Photo 2: Test sample before testing



Photo 3: Test sample after testing

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	Sample ID	Depth (ft)	Moisture Content %	LL	PL	PI	% Pass #200	Classification
●	**B-03**	**5.0**	**(44.8)**	**51**	**28**	**23**		**CH**
⧓	**B-05**	**2.5**	**(26.3)**	**44**	**28**	**16**		**ML**

McMILLEN JACOBS ASSOCIATES

1500 SW 1ST AVE STE 750
PORTLAND, OR 97201
TELEPHONE: 503.384.2906

ATTERBERG LIMITS

Project: Waste Water Treatment Plant - Schematic Design
Number: 5834.0
Sample Location: Sweet Home
Testing Agency: Northwest Testing, Inc.

JA_ATTERBERG_PORTLAND OFFICE ADDRESS_5834.0 SWEET HOME.GPJ_JACOBS DATA TEMPLATE_GENERAL SOIL PROJECTS.GDT 6/11/18 REV-

Point Load Strength Index Test Results ASTM D-5731

PROJECT:	Sweet Home WWTP	**LAB SAMPLE NO.:**	
PROJECT NO.:	5834.0	**SAMPLE NO.:**	5834.0 - B-5
PROJECT LOCATION:	Sweet Home, OR	**SAMPLE DESCRIP:**	Basalt
SAMPLED BY:	Julia Irizarry	**DATE REPORTED:**	5/11/2018
DATE SAMPLED:	5/2/2018	**REPORTED BY:**	Devin Roth

Sample No.	Test Number	Test Type*	Rock Type	Width, W	Depth or Diameter, D	Failure Load, P	De^2	Point Load Strength Index, $I_{s(50)}$	Uniaxial Compressive Strength, UCS
				(in)	(in)	(lbs)	(in^2)	(psi)	(psi)
1	1	d	Basalt	5.31	2.36	5959	10313	513	12563
2	2	d	Basalt	5.91	2.36	3828	11459	304	7437
2B	3	d	Basalt	3.23	2.36	5158	6264	653	13717
3	4	d	Basalt	10.04	2.36	5104	19481	268	5098
3B	5	d	Basalt	5.59	2.36	6882	10848	569	13951
5	6	d	Basalt	6.69	2.36	8044	12987	579	13315
6	7	d	Basalt	5.12	2.36	4598	9931	407	9778
7	8	d	Basalt	4.13	2.36	6830	8021	714	17138
8	9	d	Basalt	11.42	2.36	8044	22154	383	9185
9	10	d	Basalt	5.20	2.36	7882	10084	690	14493
							Min	**268**	**5098**
							Max	**714**	**17138**
							Avg	**508**	**11667**

Size Corrected Point Load Index, $Is_{(50)}$

$I_{s(50)}$ = **508 psi** or **73,159 psf** or **3.5 MPa**

Mean Uniaxial Compressive Strength, σ_c

σ_c = **11,667 psi** or **1,680,111 psf** or **80 MPa**

*Test Type

d = diametral
a = axial
b = block
l= lump

Exhibit C

Sample AIS Forms

SAMPLE AIS CERTIFICATION LETTERS

The following information is provided as a sample letter of **step** certification for AIS compliance. Documentation must be provided on company letterhead.

<<Date>>

<<Company Name>>
<<Address>>
<<City State Zip>>

SUBJECT:

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxxx
2. Xxxx
3. Xxxx

Such process took place at the following location:

_____

If any of the above compliance statements change while providing material to this project, we will immediately notify the prime contractor and the engineer.

Sincerely,
<<Company Name>>

Name - *Signed by company representative*

Title

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

<<Date>>

<<Company Name>>
<<Address>>
<<City State Zip>>

SUBJECT:

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxxx
2. Xxxx
3. Xxxx

Such process took place at the following location:

_____

If any of the above compliance statements change while providing material to this project, we will immediately notify the prime contractor and the engineer.

Sincerely,
<<Company Name>>

Name - *Signed by company representative*

Title

Exhibit D

Geotechnical Engineering Report

City of Sweet Home
Mahler Water Reclamation Facility Improvements

Geotechnical Engineering Report

Final Submittal

McMILLEN JACOBS ASSOCIATES

Prepared for

WEST YOST
Water. Engineered.

December 2022

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Appendix A Boring Logs
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Acronyms and Abbreviations

ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
bgs	below ground surface
bpf	blows per foot
CDF	controlled density fill
CLSM	controlled low strength material
CSZ	Cascadia Subduction Zone
g	standard acceleration due to gravity
GDR	Geotechnical Data Report
GER	Geotechnical Engineering Report
H	height of buried wall
H_w	submerged portion of buried wall
IBC	International Building Code
$I_{S(50)}$	point load index
LBVS	Little Butte Volcanic Series
M	earthquake magnitude
MCE	maximum credible earthquake
MJA	McMillen Jacobs Associates
NHSMP	National Seismic Hazard Mapping Project
No.	number
N-value	standard penetration test blows to advance final foot
OAR	Oregon Administrative Rules
ODOT	Oregon Department of Transportation
OSHA	Occupational Safety and Health Administration
OSSC	Oregon Structure Specialty Code
PGA	peak ground acceleration
pci	pounds per cubic inch
psi	pounds per square inch
RMR	Rock Mass Rating
RQD	Rock Quality Designation
SEI	Structural Engineering Institute
SPT	Standard Penetration Test
USGS	United States Geological Survey
West Yost	West Yost Associates, Inc.
WRF	Wastewater Reclamation Facility

Distribution

To: Preston Van Meter, P.E.
West Yost Associates, Inc.

From: Wolfe Lang, P.E., G.E.
McMillen Jacobs Associates

Prepared By: Jeff Quinn, P.E.
McMillen Jacobs Associates

Reviewed By: Wolfe Lang, P.E., G.E.
McMillen Jacobs Associates

Revision Log

Revision No.	Date	Revision Description
Final Submittal	July 22, 2022	Final Submittal to West Yost
Final Submittal, Rev. No. 1	December XX, 2022	Final Submittal Incorporating Site Revisions

1.0 Introduction

1.1 General

McMillen Jacobs Associates (MJA) has been retained by West Yost Associates, Inc. (West Yost) to provide geotechnical engineering services for the City of Sweet Home Mahler Water Reclamation Facility Improvements project. The project owner is the City of Sweet Home. The Project site location is shown in the Vicinity Map, Figure 1. This Geotechnical Engineering Report (GER) presents the results of our field explorations, laboratory testing, geotechnical analyses, and design and construction recommendations. Detailed discussions of site explorations, site geology, and laboratory testing is summarized in a Geotechnical Data Report (GDR) prepared by MJA, dated July 2022.

1.2 Project Description

The City of Sweet Home Mahler Water Reclamation Facility (WRF) is located at 1357 Pleasant Valley Road, in Sweet Home, Oregon. The WRF has been in service since 1947 with two major upgrades completed in 1974 and 1994 (Brown & Caldwell, 2016). Our project understanding is based on our communication with West Yost and the 90 percent submittal plans entitled *Mahler Water Reclamation Facility Improvements Project – Phase 1*, dated June 2022, prepared by West Yost. The proposed WRF improvements are shown in Figure 2. We were not provided with structural loading information for the above WRF improvements. We understand the WRF is to remain operational during construction of the proposed improvements.

The proposed WRF improvements include the following:

- *Main Electrical and Blower (MEB) Building*: The 22- by 67.5-foot MEB Building will be located within the north-central part of the WRF site. The interior of the building will be supported on a 6-inch-thick slab on grade foundation, while the perimeter of the structure will be supported on a 1.5-foot-wide continuous spread footing. A new generator, which will be installed on the north side of the MEB Building, will be supported on 12- by 28-foot, 12-inch-thick reinforced concrete slab on grade with thickened edges. Site grades will be raised up to approximately 6 feet in this area to facilitate construction of the MEB Building, with approximately 4 to 6 feet of fill placed below the building footprint. The approximately 6-foot-tall fill slope on the east side of the MEB Building will descend at 2H:1V (horizontal:vertical).
- *Influent Pump Station (IPS)*: The new, 40- by 56-foot IPS will be constructed just north of the existing IPS, within the southeast corner of the WRF site. The approximate southern half of the IPS structure, which supports above-grade piping, will be supported on a 12-inch-thick reinforced concrete slab on grade with thickened edges. The approximate northern half of the IPS structure, which houses five submerged pumps, will be supported on a 28-inch-thick reinforced concrete slab with a base elevation of approximately 491.2 feet (e.g., about 26.2 feet below grade).
- *Sludge Blend Tank*: The new, 28-foot diameter sludge blend tank will be constructed in the southeast corner of the WRF site just east of the solids building. The sludge blend tank will be

approximately 25 feet tall and will be supported on a 1.5-foot-thick, reinforced concrete mat foundation with a base elevation of approximately 515.3 feet (e.g., about 1.5 feet below grade).

- *Digested Sludge Holding Tank*: The new, 36-foot diameter sludge blend tank will be constructed in the southeast corner of the WRF site just north of the sludge blend tank. The sludge blend tank will be approximately 26 feet tall and will be supported on a 1.5-foot-thick, reinforced concrete mat foundation with a base elevation corresponding to approximately 1.5 feet below grade.
- *Solids Building Expansion*: The existing solids building will be enlarged from its existing 22- by 37-foot plan dimensions to approximately 32- by 57-foot plan dimensions and will be supported on a shallow foundation system consisting of perimeter footings and an interior slab-on-grade.
- *40*-foot Diameter Digestor: The new digestor will be constructed within the footprint of the existing, approximately 55-foot diameter digestor (DG1) in the southeast corner of the WRF site. We understand that the existing foundation will be used to support the new digestor structure.
- *Temporary Generator*: A temporary electrical generator, supported on an 18-inch-thick reinforced concrete slab, will be installed on the south side of existing Secondary Clarifier SC60.
- *Existing Bathroom Relocation*: The existing bathroom, currently along the northern fence line and east of the existing entrance gate, will be moved to the north side of the boat ramp access road.
- *Retaining Walls*: To support new fills placed for site grading, as well as proposed cuts, there are six retaining walls (designated Wall 1 through Wall 6) proposed as part of the improvements. The retaining walls will be cast-in-place, reinforced concrete cantilevered walls ranging in height from 2.5 to 6.75 feet.
- *Existing Structures/Facilities to Remain In Use*: Secondary Clarifier Nos. 1 through 3; RAS/WAS Pump Station; Aeration Basin; Chlorine Contact Chamber; Administration and Operations Building; Sand Filters; Lime Silo; and the electrical building on the south side of existing SC60.
- *Proposed Piping Improvements*: 12-inch storm drain;10-inch storm drain; 8-inch to 36-inch sanitary sewer; 12-inch IPS forcemain to headworks (HDPE pipe); 24-inch RS IPS to Headworks (HDPE pipe); 6-inch PS forcemain; 12-inch RDPS; 6-inch SL-WAS; 6-inch SL-D forcemain; 4-inch PSC; and 10-inch DIP waterline relocation.
- *Demolition of the Following Existing Structures*: Backwash Storage; Waste Backwash Storage; the approximately 25- by 50-foot storage building on the west side of the WRF site; and several buildings clustered together in the central portion of the WRF site including the carport, an approximately 40- by 40-foot CMU building, an approximately 25- by 50-foot Quonset Hut storage building, and an approximately 15- by 35-foot shed.
- *Primary Clarifier*: The new primary clarifier will consist of an approximately 65- by 85-foot reinforced concrete tank structure. The base depth of the new primary clarifier will be approximately 9.5 to 22.5 feet below existing site grades and will be supported on an 18-inch-thick, reinforced concrete mat foundation system. The primary clarifier will be expanded to the north (designated Primary Clarifier 4) at a future date.
- *Secondary Clarifier 90 (SC90)*: SC90 will consist of an approximately 95-foot diameter, 17-foot-tall reinforced concrete tank structure. SC90 will be a primarily below-grade structure, with the tank walls being about 2 feet above finish grade. The base depth of the SC90 will be

approximately 15 feet below existing site grades and will be supported on a reinforced concrete mat foundation.

- *Building A (O&M and Controls)*: This 40- by 120-foot building, oriented northeast-southwest, will be constructed at the west end of the WRF site and will be an at-grade structure supported on an interior slab-on-grade. The perimeter of the structure and interior load-bearing walls will be supported on shallow spread footings.
- *Building A (Headworks and Dewatering)*: This 40- by 120-foot building, oriented southeast-northwest, will abut the southeast corner of the O&M and Controls building to form the leg of the L-shaped Building A. This will be an at-grade structure supported on an interior slab-on-grade. The perimeter of the structure and interior load-bearing walls will be supported on shallow spread footings.
- *SC90 WAS and RAS Pump Stations*: Each of these two pump stations will be an approximately 10-foot diameter reinforced concrete vault structure with a base depth of approximately 16.5 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Existing Secondary Clarifier SC60 RAS/WAS Pump Station*: This pump station will be an approximately 10- by 20-foot reinforced concrete vault structure with a base depth of approximately 12.5 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Aeration Basin No. 3*: Aeration Basin No. 3 will consist of an approximately 40- by 75-foot reinforced concrete structure. The base depth of Aeration Basin No. 3 will be approximately 13 to 18 feet below existing site grades and will be supported on a reinforced concrete mat foundation. Aeration Basin No. 3 will be expanded to the north (designated Aeration Basin No. 4) at a future time and will likely be founded at the same depth as Aeration Basin No. 3.
- *Tertiary Filters*: The tertiary filters will be housed in an approximately 25- by 35-foot reinforced concrete tank structure. The base depth of Aeration Basin No. 3 will be approximately 18 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Tertiary Building, UV Disinfection, and UW Storage*: These facilities will be located adjacent to one another within an approximate 35- by 40-foot area. The UW Storage and UV Storage facilities will be constructed within the existing chlorine contact chamber. The portion of the Tertiary Building housing the utility water pumps will likely be approximately 7 feet below existing site grades.
- *Outfall*: The outfall pipe leads from the UV disinfection chamber to the South Santiam River. This will be part of a future project phase.
- *Other Improvements*: The approximate western half of the WRF site, an area north of the boat ramp access drive, and a narrow area along the south site boundary will be surfaced with gravel. In addition, new asphalt pavements along the entrance road from Pleasant Valley Road and within most of the WRF site; new concrete curbs and sidewalks; two new entrance gates; and a new chain-link fence.

1.3 Purpose and Scope of Work

The purpose of this investigation was to characterize the subsurface conditions at the site and develop geotechnical design recommendations for the proposed project. Specifically, our scope of work included the following:

- Assess soil seismic profile (site classification) and parameters in accordance with the 2019 Oregon Structure Specialty Code (OSSC) to support structural design. If the site is potentially liquefiable, the soil seismic profile will be only for the facilities with seismic periods less than 0.5 second.
- Evaluate the liquefaction potential and liquefaction-induced effects, such as seismic-induced settlements, lateral spreading, and potential reduction in soil bearing capacity.
- Evaluate static and seismic soil bearing capacity, subgrade modulus, and total and differential settlements for the proposed foundations and facilities.
- Provide recommendations and design criteria for shallow foundation systems.
- Provide static and seismic lateral earth pressure recommendations for the embedded walls of the proposed structures.
- Provide lateral load resistance recommendations, including passive earth pressure and coefficient of friction.
- Provide recommendations for shoring and dewatering of deep excavations.
- Provide recommendations for site preparation, grading, drainage, and wet-weather earthwork procedures.
- Provide engineered fill recommendations and compaction criteria for the foundations.

2.0 Field and Laboratory Investigation

2.1 Subsurface Exploration

Initial exploratory borings were completed by Western States Soil Conservation (WSSC) of Hubbard, Oregon using a truck-mounted CME-75 drill rig. The explorations were completed between April 30 and May 2, 2018. This exploration program included advancing five boreholes, designated B-1 through B-5, and fifteen probe-holes, designated P-01 through P-15. The boreholes were advanced using mud-rotary drilling and HQ rock coring techniques to depths ranging from 5.8 to 23 feet bgs. The probe-holes were advanced using hollow-stem auger drilling techniques and extended to between 2.5 and 15 feet bgs (top of bedrock).

Additional air-track probe holes were advanced on October 29, 2019 by McCallum Rock Drilling of Salem, Oregon using a Furakawa 900 track-mounted drill rig. This exploration program included advancing 12 air-track probe holes (designated P-16 through P-27) to depths ranging from 11 to 26 feet bgs.

On June 20, 2022, eight additional probe-holes (designated P-28 through P-35) were advanced by PLI Systems of Hillsboro, Oregon using a truck-mounted Mobile B59 drill rig. The probe-holes were advanced using hollow-stem auger drilling techniques and extended to between 3.7 and 19 feet bgs.

On November 22, 2022, one additional probe-hole (designated P-36) was advanced by WSSC using a truck-mounted CME-75 drill rig. P-36 was advanced using hollow-stem auger drilling techniques and extended to 11.5 feet bgs.

Details of the exploration and sampling intervals are provided in the project GDR (McMillen Jacobs, 2022). The exploration locations are shown in Figure 2 and the exploration logs are provided in Appendix A.

2.2 Piezometers

Two-inch diameter piezometers were installed in two boreholes to allow for long-term, stabilized groundwater level measurements. Piezometers were installed in the following boreholes:

- Boring B-3, screened between 9 and 12 feet bgs.
- Boring B-5, screened between 5.5 and 8.5 feet bgs.

2.3 Laboratory Testing

Field samples obtained from exploratory borings were delivered to the MJA Portland office for further examination and storage. Each of the samples was re-examined and compared to the field boring log description to confirm the field classifications and maintain consistency. Representative samples were then selected for laboratory testing. Testing was performed on soil and rock samples from boreholes B-1,

B-3, and B-5. The laboratory test results are provided in Appendix B. The laboratory testing included the following index and strength property tests, performed in accordance with relevant ASTM standards:

- Moisture content analyses (ASTM D 2216).
- Atterberg limits tests (ASTM D 4318).
- Point load tests of rock core (ASTM D 5731).
- Unconfined compressive strength of intact rock core (ASTM D 7012).

Point load testing was performed by MJA. All other laboratory testing was performed by Northwest Testing, Inc. of Wilsonville, Oregon. Laboratory test results are presented in Appendix B.

3.0 Site Conditions

3.1 Site Description

The site is currently occupied by the existing WRF, located on the south bank of the South Santiam River near its confluence with Ames Creek. The site is fenced around its perimeter and is bordered by the Albany and Eastern railroad tracks to the south, a boat ramp access road to the north (and the South Santiam River beyond), a private property to the west, and Ames Creek to the east. In general, the site slopes gently from the west to the east (i.e., towards Ames Creek) and gently from the south to the north (i.e., towards the South Santiam River). The eastern two-thirds of the site (in which the existing aeration basin and the clarifiers are located) is situated on a relatively level terrace that generally sits 5 to 7 feet lower than the western one-third of the site and approximately 10 feet above Ames Creek to the east.

A paved access road runs along the north side of the site, from the Pleasant Valley Road WRF entrance at the west end of the site to the boat ramp and recreation use area at the north-northeast end of the site. The paved WRF road, heading south from the access road from the main entrance gate, provides access to the main areas within the WRF. Bedrock is exposed along the South Santiam River and Ames Creek approximately 100 feet to the north-northeast of the site. Exposed bedrock on the riverbank slopes steeply into the river.

3.2 Geological Setting

The project is located in the foothills of the Western Cascades, a north-south trending physiographic region that stretches from northern California to British Columbia, tucked between the Willamette Valley to the west and the younger High Cascades to the east. The Western Cascades in Oregon were formed by a series of volcanic events from approximately 35 to 17 million years ago. The region is marked by densely forested hills dissected by the region's many rivers (Madin, 1990; Schlicker and Deacon, 1967; Wilson, 1998; Popowski, 1996). A detail description of the geological setting of the site is described in the project GDR (McMillen Jacobs, 2019).

3.3 Subsurface Conditions

The materials encountered in the explorations were grouped into three geotechnical units: Pavement, Fill, and Basalt (Little Butte Volcanic Series – Tholeiitic Basalt). These units have been defined by their geologic origin, stratigraphic position, engineering properties, and their distribution in the subsurface. Variations in subsurface conditions may exist between the locations of the borings. Contacts between the units may be more gradational than shown in the boring logs in Appendix A. The SPT N-values, shown on the boring logs and discussed below, are reported as counted in the field (uncorrected). Photos of rock core samples are provided in Appendix C. Cross sections of subsurface conditions are shown in Figures 3A through 3F. The following sections describe each geotechnical unit in greater detail.

3.3.1 Pavement

Asphalt concrete (AC) was encountered in 12 borings, as described in the boring logs in Appendix A. The AC pavement ranged from about 4 to 6 inches in thickness and was typically underlain by about 4 inches of crushed rock base. Portland Cement Concrete (PCC) pavement was encountered in three borings (B-1,

P-27, and P-36). In B-1, the PCC pavement was about 18 inches thick and underlain by about 12 inches of crushed rock base. In P-27 and P-36, the PCC pavement section was about 6 inches thick.

3.3.2 Fill

Undocumented fill materials were present in all the explorations and were likely placed for site grading and development. We observed highly variable fill depths across the site, extending from the existing ground surface to depths ranging from 2 to 16.5 feet bgs. Additionally, the fill depths often varied considerably over short distances. The fill was underlain by bedrock, and generally consisted of silt with variable amounts of organics, lean to fat clay with variable amounts of sand and gravel, sand and gravel with variable amounts of silt and clay, and organic soil with variable amounts of sand. Undocumented fill refers to materials placed without (available) records of subgrade conditions or evaluation of compaction. Standard Penetration Tests (SPTs) conducted within the fill yielded N-values ranged from 0 to 45 blows per foot (bpf). The higher N-values were generally recorded at the fill-bedrock contact.

3.3.3 Boulders

Based on drilling action and slow advancement rates, we believe that large cobbles or boulders were encountered between 7.5 to 9 feet bgs in boring P-36, located in the southeast corner of the WRF site.

3.3.4 Basalt - Little Butte Volcanic Series Tholeiitic Basalt

The Little River Butte Volcanic Series (LRBV) in the project area consists of tholeiitic basalt and is bedrock in this area. The basalt was encountered beneath the fill in all the explorations. The depth to the LRBV ranged from 2.0 feet to 16.5 feet bgs.

The unconfined compressive strength of the basalt varied between approximately 7,000 psi and 26,000 psi with an average value of approximately 19,000 psi. The results of point load tests indicate that the Point Load Index ($I_{S(50)}$) of the basalt ranged between approximately 270 psi and 715 psi, with an average value of 510 psi. We suspect the lower value of unconfined compressive strengths may correspond to failure along the weak planes. Definition of rock strength and depth to bedrock at each exploration are provided in Table 3-1 and Table 3-2, respectively. The basalt characteristics are discussed in more details in Section 3.4. The depth to bedrock is also included on the geologic cross sections shown in Figures 3A through 3F.

Table 3-1. Definition of Rock Strength Descriptions

Grade[1]	Approximate Uniaxial Compressive Strength (psi)	Qualitative Description
R0	35 – 150	Extremely Weak
R1	150 – 700	Very Weak
R2	700 – 3,600	Weak
R3	3,600 – 7,200	Medium Strong
R4	7,200 – 14,500	Strong
R5	14,500 – 36,000	Very Strong
R6	>36,000	Extremely Strong

[1] Rock strength grades from Brown (1981).

Table 3-2. Depth of Fill / Depth to Rock Summary

Exploration ID	Associated Structure(s)	Ground Surface Elevation (feet)	Depth to Rock (feet)	Rock Surface Elevation (feet)
B-1	--	516.5	2.5	514.0
B-2	SC90 WAS Pump Station	518.3	16.5	501.8
B-3	Primary Clarifier	529.9	11	518.9
B-4	Building A – O&M & Controls	538.6	4.5	534.1
B-5	MEB Building	528.8	8.5	520.3
P-01	--	517.3	11	506.3
P-02	--	526.1	11.5	514.6
P-03	Primary Clarifier	530.4	16	514.4
P-04	Building A – Headworks & Dewatering	530.8	7.5	523.3
P-05	Building A – Headworks & Dewatering	533.1	3.5	529.6
P-06	Building A – O&M & Controls	536.2	3.5	532.7
P-07	--	538.0	2.5	535.5
P-08	Building A – O&M & Controls	535.3	7.5	527.8
P-09	--	530.5	4	526.5
P-10	--	530.1	5.5	524.6
P-11	MEB Building	529.8	5.5	524.3
P-12	MEB Building	526.4	5	521.4
P-13	Future Aeration Basin No. 4	523.6	8.5	515.1
P-14	Aeration Basin No. 3	521.7	5.5	516.2
P-15	--	519.1	2.5	516.6
P-16	IPS	517.1	12.0	505.1
P-17	--	516.5	6.0	510.5
P-18	SC90, SC60 RAS/WAS Pump Station	518.5	9.0	509.5
P-19	--	518.0	6.0	512.0
P-20	SC90 RAS Pump Station	525.4	8.0	517.4
P-21	Primary Clarifier, Aeration Basin No. 3	521.8	6.0	515.8
P-22	Aeration Basin No. 3	518.5	7.0	511.5
P-23	Primary Clarifier	530.4	15.0	515.4
P-24	MEB Building	529.7	3.0	526.7
P-25	Future Outfall	506.4	2.0	504.4
P-26	Future Outfall	507.2	3.0	504.2
P-27	--	516.6	10.0	506.6
P-28	IPS	516.5	11.0	505.5
P-29	IPS	517.3	12.5	504.8
P-30	SC90	519.8	11.0	508.8
P-31	SC90	520.8	10.0	510.8
P-32	Primary Clarifier, Future Primary Clarifier No. 4	530.4	10.0	520.4
P-33	Future Outfall	529.6	3.5	526.1
P-34	Tertiary Filters	516.9	15.0	501.9
P-35	-	517.5	6.0	511.5
P-36	Sludge Blend Tank	516.8	10.8	506.0

3.4 Rock Mass Classification

Two rock mass classification systems, Rock Quality Designation (RQD) and Rock Mass Rating (RMR), were used to evaluate and characterize rock mass conditions for providing recommendations regarding ground behavior, excavation methods, and design of the embedded walls. These classifications were originally developed for tunneling but are useful in estimating rock excavatability.

3.4.1 Rock Quality Designation (RQD)

RQD values are a modified core recovery in which only core lengths equal to or longer than 4 inches are measured in an individual core run (Bieniawaski, 1989). RQD values are presented on the boring logs in Appendix A. The RQD ranged from 42 to 86 percent, indicating "poor" to "good" rock quality, with an average RQD of 67 percent, indicating a "fair" condition of the rock.

3.4.2 Rock Mass Rating (RMR) System

The RMR (Bieniawaski, 1989) is a rating system that considers six numerical rock mass inputs including: strength of intact rock, RQD, discontinuity spacing, condition of discontinuities, orientation of discontinuities relative to excavation, and groundwater conditions. An RMR range of 60 to 70 was estimated for the encountered conditions, indicating a "good" rock condition. RMR calculation sheets summarizing input and results are included in Appendix D.

3.5 Groundwater

Groundwater observation wells were installed in borings B-3 and B-5. Initial groundwater levels recorded on May 2, 2018, with subsequent levels recorded on October 29, 2019, and June 20, 2022. We also observed groundwater in nine other exploration locations, as summarized in Table 3-3. Groundwater levels are noted on the boring logs in Appendix A.

Groundwater levels may vary with precipitation, the time of year, and/or other factors. Generally, groundwater highs occur near the end of the wet season in late spring and groundwater lows occur near the end of the dry season in the early fall.

Table 3-3. Groundwater Level Measurements

Boring ID	Piezometer	Borehole Elevation (feet)	Depth to Groundwater (feet)			Groundwater Elevation (feet)		
			May 2, 2018	Oct 29, 2019	June 20, 2022	May 2, 2018	Oct 29, 2019	June 20, 2022
B-2	No	518.3	2.5	-	-	515.8	-	-
B-3	Yes	529.9	2.9	3.6	8.2	527.0	526.3	521.7
B-4	No	538.6	2.0	-	-	536.6	-	-
B-5	Yes	528.8	5.0	7.0	6.8	523.8	521.8	522.0
P-03	No	530.4	8.5	-	-	521.9	-	-
P-09	No	530.5	3.0	-	-	527.5	-	-
P-13	No	523.6	6.0	-	-	517.6	-	-
P-15	No	519.1	2.5	-	-	516.6	-	-
P-29	No	517.3	-	-	10.5	-	-	506.8
P-31	No	520.8	-	-	9.2	-	-	511.6
P-32	No	530.4	-	-	9.7	-	-	520.7

4.0 Seismic and Geologic Hazard Evaluation

4.1 General

The seismic hazards evaluation was performed in general accordance with the 2019 Oregon Structure Specialty Code (OSSC, 2019) and ASCE's Minimum Design Loads for Buildings and Other Structures, 2016 Edition (ASCE/SEI 7-16). The OSSC requires evaluating the seismic hazards for the Maximum Credible Earthquake (MCE) having a 2% probability of exceedance in a 50-year period (2,475-year return period).

4.2 Regional Seismicity

The Pacific Northwest is a seismically active region that has three principal seismic sources: (1) the Cascadia Subduction Zone (CSZ) megathrust, which represents the interface between the subducting Juan de Fuca plate and the overriding North American plate; (2) faults located within the Juan de Fuca plate (referred to as CSZ intraplate or intraslab sources); and (3) crustal faults principally in the North American plate (Wong and Silva, 1998).

4.3 Site Classifications

The project site was assigned a seismic site class following code-based procedures in ASCE/SEI 7-16, Chapter 20 (2016). Site class is used to categorize common subsurface conditions into broad classes to which ground motion attenuation and amplification effects are assigned. Site class accounts for the conditions encountered in the upper 100 feet of the subsurface profile. Shallow bedrock was encountered during the subsurface investigation and most of the structures are anticipated to be supported on the bedrock. Therefore, a Site Class B is appropriate for design purposes.

4.4 Seismic Design Parameters

The 2019 OSSC requires that spectral response accelerations be developed based on the ASCE 7-16. We developed spectral response accelerations using the online ASCE 7 Hazard Tool, which references ground motion procedures in accordance with ASCE 7-16 and is based on the USGS 2014 National Seismic Hazard Mapping Project (NSHMP) developed for the Maximum Considered Earthquake (MCE) (Peterson et. al., 2014). The MCE consists of ground motions (accelerations) with a 2-percent probability of exceedance in 50 years (return period of 2,475 years). The recommended spectral acceleration parameters for use in structural design are provided in Table 4-1. For pipeline design we recommend using a Peak Ground Velocity (PGV) of 10 inches per second.

Table 4-1. 2019 OSSC MCE Spectral Acceleration Parameters for Site Class B

Parameter	0.2 Second	1 Second
Mapped MCE_R (Rock site)	S_S = 0.63 g	S_1 = 0.34 g
Site Coefficients	F_a = 0.9	F_v = 0.8
Site-Adjusted MCE_R	S_{MS} = 0.57 g	S_{M1} = 0.27 g
Design MCE_R	S_{DS} = 0.38 g	S_{D1} = 0.18 g
Mapped MCE_G PGA (Rock Site)	0.29 g	
Site Coefficient F_{PGA}	0.9	
Site-adjusted MCE_G PGA	0.26 g	

4.5 Liquefaction

4.5.1 Overview

Liquefaction is a phenomenon affecting saturated, granular soils in which cyclic, rapid shearing from an earthquake results in a drastic loss of shear strength and a transformation from a granular solid mass to a viscous, heavy fluid mass. The results of soil liquefaction include loss of shear strength, loss of soil materials through sand boils, flotation of buried chambers/pipes, and post liquefaction settlement.

4.5.2 Liquefaction Hazard

The Project site is underlain by competent basalt bedrock, encountered at shallow depths, overlain by variable amounts of fill. However, there are localized areas of the site that are underlain by fill extending to depths up to about 16.5 feet bgs, as indicated in Table 3-2. Our liquefaction analyses indicated that the loose/soft fill materials below the groundwater table are potentially liquefiable. Since the fill materials are not laterally continuous, widespread soil liquefaction is not considered to be a hazard at the site.

Anticipated foundation conditions for the proposed structures are summarized in Table 6-1. The excavations required to facilitate construction of the below-grade structures will effectively remove the potentially liquefiable soils and these structures will be founded on basalt bedrock. Therefore, the risk of liquefaction is negligible for the below-grade structures. For the at-grade structures (i.e., Building A and the MEB Building), the total anticipated liquefaction-induced settlement is on the order of 1 inch with differential settlement on the order of ½ inch and occurring across the slab-on-grade foundation and across the long axis of these buildings. For the IPS, the approximate southern half of which will be supported on a slab-on-grade foundation, we anticipate the total liquefaction-induced settlement will be on the order of 1 inch, with differential settlement on the order of ½ inch and occurring across the slab-on-grade foundation.

We evaluated liquefaction susceptibility using SPT-based methods presented by Boulanger and Idriss (2014), as well as Idriss and Boulanger (2008). Our analyses considered the aggregate seismic event (or MCE), a design-level event that considers the cumulative effect from all seismic sources in the region for

the indicated probability of exceedance (i.e., 2 percent in 50 years). The spectral acceleration parameters for the MCE are summarized in Table 4-1. Estimating the ground surface PGA was accomplished using aggregated probabilistic data for design-level earthquakes available at the USGS Unified Hazard Tool website. The resulting aggregate seismic event used in our liquefaction susceptibility and settlement analyses had an earthquake magnitude of 8.3 and peak ground acceleration (PGA) of 0.29 g. Groundwater was modeled as the seasonal high level at each boring/probe location, based on groundwater measurements and observations discussed in Section 3.5.

4.6 Other Seismic Hazards

Due to the shallow bedrock and overall gently-sloping site, we conclude that other seismic hazards are negligible. These seismic hazards include seismically-induced landslides, liquefaction (apart from the localized areas discussed above), lateral spreading, ground motion amplification, and surface rupture. The nearest Class A fault mapped by the USGS is the Owl Creek Fault, located approximately 25 miles west of the site. Therefore, fault rupture is not considered a hazard to the project.

5.0 Conclusions and Key Geotechnical Considerations

Based on the results of our field explorations and analyses, the site can be developed as described in Section 1.2 of this report, provided the recommendations presented in this report are incorporated into the design and development. We conclude the primary geotechnical considerations are the presence of highly variable and weak undocumented fill materials and the associated excessive settlement of the at-grade structures due to static and seismic loading. Other important considerations for the Project include the presence of shallow groundwater and shallow strong to very strong basalt bedrock.

5.1 Settlement Potential of At-Grade Structures

Due to the presence of highly variable undocumented fill materials across the site, we conclude there is a risk for uneven subgrade response from structural loads for at-grade structures. Adverse effects resulting from uneven subgrade response of the soils could take the form of excessive total and differential static settlement and/or bearing capacity failure. In addition, there is the potential for localized liquefaction-induced settlement within the undocumented fill materials below the at-grade structures. Therefore, we do not recommend the proposed at-grade structures (discussed in Section 1.2) be supported by shallow spread footing, slab-on-grade, or mat foundations without subgrade improvement in the form of the over-excavation of a minimum of 3 feet of undocumented fill. For the critical structures, such as the IPS and MEB Building, complete over-excavation of the undocumented fill and replacement with compacted structural fill are recommended to mitigate potential static and liquefaction-induced settlements. For the Sludge Blend Tank and the Digested Sludge Holding Tank, we recommend that the undocumented fill materials be over-excavated to 5 feet bgs and replaced with a crushed rock mat section.

Foundation recommendations for mitigating excessive settlement for the at-grade structures are presented in Section 6.2 and in Section 6.3 for the Sludge Blend Tank and the Digested Sludge Holding Tank.

5.1.1 Liquefaction-Induced Settlement

Potentially liquefiable soil is present in isolated areas (i.e., where undocumented fill materials are present) below the proposed at-grade structures. As discussed in Section 4.5, the results of our liquefaction-induced settlement analyses indicated up to 1 inch of total vertical settlement, and about ½ inch of differential settlement for the portion of the IPS supported on a slab-on-grade foundation, as well as for the MEB Building and Building A.

5.1.2 Static Settlement

Building A: Below the Building A footprint, the undocumented fill extends to depths ranging from 2.5 to 7.5 feet and are generally less than 4.5 feet. We estimated that about ½ to 1½ inch settlement may develop within the building footprint with the differential settlement of about 1 inch across the building. For Building A, we recommend to over-excavate of a minimum of 3 feet of undocumented fill and replace with compacted structural fill. This will reduce the total static settlement to less than 1 inch and differential settlement to less than ½ inch.

IPS Structure: The portion of the IPS that will be supported on a slab-on-grade foundation is underlain by 8 to 12 feet of soft, predominately fine-grained fill materials which may develop up to about 2 inches of

static settlement. The adjacent portion of the IPS will be founded at a depth of about 26 feet on hard basalt bedrock and is not expected to develop any settlement. Therefore, there is the potential for up to 2 inches of differential settlement between the at-grade and below-grade portions of the IPS, which could affect structural performance as well as excessive movement of the pipes and their connections. We recommend complete over-excavation of the undocumented fill materials below the at-grade portion of the IPS to mitigate the potential for static differential settlement.

MEB Building: About 4 to 6 feet of fill will be placed below the MEB Building footprint to achieve the desired finish grade. The fill placement will induce stress increases (up to approximately 800 psf) on the soft, compressible fill materials that extend up to about 8.5 feet below existing site grades below the MEB Building footprint. We anticipate consolidation settlement on the order of 3 inches may occur due to the fill placement, with differential settlement of up to 1½ inches across the building. To mitigate the potential for total and differential static settlement, we recommend complete over-excavation of the undocumented fill materials below the MEB Building prior to mass grading operations.

Sludge Blend Tank and Digested Sludge Holding Tank: The 28-foot diameter Sludge Blend Tank and the 36-foot diameter and the Digested Sludge Holding Tank are underlain by undocumented fill materials extending to about 10.75 feet bgs, based on boring P-36. The proposed bottom-of-slab depths for both tanks is approximately 1.5 feet bgs (i.e., at-grade structures). If founded on existing conditions, settlements of the tanks will likely range from about 2 to 2.5 inches, and differential settlement ranging from 1 to 1.25 inch. To reduce respective total and differential settlements to less than 1 inch and ½ inch, we recommend the undocumented fill materials be over-excavated to 5 feet bgs and replaced with a reinforced crushed rock section as discussed in Section 6.3.

5.2 Shallow Groundwater

Due to the presence of shallow groundwater at the subject site, we anticipate temporary excavations will likely require dewatering, depending on the time of year construction takes place. Recommendations for groundwater control during construction are presented in Section 7.4.

5.3 Basalt Bedrock

The explorations encountered strong to very strong (R4 to R5) basalt bedrock at depths ranging from 2.0 to 16.5 feet across the site. We understand that excavations for the proposed improvements are anticipated to be up to 24 feet bgs (e.g., for the primary clarifier). Therefore, rock excavation will be required. Due to its strong to very strong nature, we anticipate that the basalt bedrock will not be rippable by typical construction equipment and will require drilling and blasting. Recommendations for rock excavation are presented in Section 7.0.

6.0 Design Recommendations

6.1 Foundation Recommendations for Below-Grade Structures

Based on the 90 percent submittal plans for the project, the below-grade structures will be supported on reinforced mat foundations. Spread footing foundations may also be used for foundation support of the below-grade structures. Recommendations for these types of foundations are presented in the following sections. Table 6-1 presents a summary of the anticipated foundation conditions for the proposed below-grade structures.

Table 6-1. Anticipated Foundation Conditions for Below-Grade Structures

Structure[1]	Bottom Depth (feet bgs)	Relevant Boring(s)	Depth to Rock[5] (feet)	Anticipated Foundation Conditions	Anticipated Rock Excavation (feet)[6]
IPS[2]	1.5	P-01, P-16, P-28, P-29	11 to 12.5	Fill	0
	26.2			Bedrock	14 to 15
Primary Clarifier[3]	9.5 to 22.5	B-3, P-03, P-21, P-23, P-32	6 to 16	Bedrock	Up to 15
Aeration Basin No. 3	13 to 18	P-14, P-21	5.5 to 6	Bedrock	7 to 12
SC90	15 (Assumed)	P-18, P-30, P-31	9 to 11	Bedrock	4 to 6
SC90 RAS PS	16.5	P-20	8	Bedrock	8.5
SC90 WAS PS	16.5	B-2	Unknown	Bedrock	0
SC60 RAS/WAS PS	12.5	P-18	9	Bedrock	4
Tertiary Filters	18	P-34	15	Bedrock	3
Tertiary Building[4]	7	n/a	n/a	Fill or bedrock	n/a

Notes:
1. Bottom depths for structures based on 90 percent submittal plans and from West Yost via email on July 19, 2022.
2. The approximate southern half of the IPS will be supported on a slab-on-grade and the approximate northern half of the IPS will be founded below grade at about 26.2 feet bgs.
3. The deepest excavation is on the west side of the primary clarifier where depth to rock ranges from about 11 to 16 feet, whereas the shallowest excavation is on the east side where the depth to rock is about is about 6 feet.
4. Due to access and existing utility and access conflicts, explorations were not able to be completed near this facility.
5. Based on results of geotechnical investigation, fill depth at the site is highly variable and therefore, depth to rock may vary significantly over short distances.
6. Only to foundation bottom elevation; likely additional excavation required below for piping, leveling course, etc.

6.1.1 Subgrade Preparation

Satisfactory subgrade support for spread footings or mat foundations associated with the proposed below-grade structures can be obtained on basalt bedrock or on imported structural fill that is properly placed and compacted on the bedrock. Based on our understanding of planned foundation depths for below grade we anticipate that bedrock will likely be encountered in all below grade structure excavations. The geotechnical engineer or his representative should be contacted to observe subgrade conditions prior to placement of forms, reinforcement steel, or structural fill.

If fill materials are present below the proposed bottom-of-foundation elevation, remaining existing fill materials should be over-excavated and replaced with imported structural fill back to required elevation.

All granular pads for footings should be constructed a minimum of 6 inches wider on each side of the footing for every vertical foot of over-excavation.

Bedrock surfaces that will support spread and continuous footings should be cut as level and as smooth as practical. Placement of foundation concrete on extremely rough bedrock surfaces is not recommended, particularly for strip or continuous footings. For spread and continuous footings, we recommend a minimum of 2 inches, and not more than 12 inches, of heavily compacted, imported structural fill be placed as a leveling course where relatively smooth and level bedrock surfaces cannot be achieved during excavation. For mat foundations, we recommend a minimum 6-inch-thick layer of imported structural fill be placed as a leveling course where relatively smooth and level bedrock surfaces cannot be achieved during excavation.

6.1.2 Minimum Footing Width & Embedment

Minimum spread footing widths should be in conformance with the current OSSC. As a guideline, we recommend individual spread footings have a minimum width of 24 inches, and continuous wall footings have a minimum width of 18 inches. All footings should be founded at least 18 inches below the lowest permanent adjacent grade to develop lateral capacity and for frost protection.

6.1.3 Bearing Pressure & Settlement

Spread footings associated with below-grade structures founded as recommended in Section 6.1.1 should be proportioned for a maximum allowable bearing pressure of 5,000 pounds per square foot (psf). This bearing pressure is a net bearing pressure, applies to the total of dead and long-term live loads, and may be increased by one-third when considering seismic or wind loads.

For spread footings associated with below-grade structures founded as recommended in Section 6.1, we estimate total static settlements to be 1 inch or less, with differential settlements between adjacent columns and/or bearing walls on the order of 0.5 inch or less.

6.1.4 Design Parameters for Mat Foundations and Floor Slabs

For the imported structural fill (including leveling course) thickness of 12-inch or less overlying the bedrock surface, we recommend a maximum modulus of vertical subgrade reaction of 300 pounds per cubic inch (pci) be used for design of mat foundations and floor slabs. For structural fill thickness more than 12 inches, such as in the over-excavation and backfill to foundation level areas, we recommend the modulus of vertical subgrade reaction to be reduced to 250 pci. The subgrade modulus values represent anticipated values, which would be obtained in a standard in situ plate test with a 1-foot square plate. Use of this subgrade modulus for floor slab design should include appropriate modifications based on dimensions as necessary.

For design of the mat foundations supporting the Sludge Blend Tank and the Digested Sludge Holding Tank, a modulus of vertical subgrade reaction of 250 pci may be used, an allowable bearing capacity of 2,000 psf may be used, if applicable. These values assume that these two tanks will be supported on improved subgrade consisting of a crushed rock mat section as discussed in Section 6.3.

6.2 Foundation Recommendations for At-Grade Structures

Shallow foundation support for the at-grade structures can be derived from shallow spread footings or mat foundations. Recommendations for these types of foundations are presented in the following sections and a summary of the proposed at-grade structures is provided in Table 6-2.

Table 6-2. Anticipated Foundation Conditions for At-Grade Structures

Structure[1]	Bottom Depth (feet bgs)	Relevant Boring(s)	Depth to Rock (feet)	Anticipated Foundation Conditions	Anticipated Rock Excavation (feet)[4]
IPS[2]	1.5	P-01, P-16, P-28, P-29	11 to 12.5	Fill	0
	26.2			Bedrock	14 to 15
MEB Building[3]	1.5	B-5, P-12, P-24	3 to 8.5	Fill	0
Sludge Blend Tank	1.5	P-36	10.8	Fill	0
Digested Sludge Holding Tank	1.5	P-36	10.8	Fill	0
Building A (O&M and Controls)	1.5 (e.g., at-grade)	B-4, P-06, P-08	3.5 to 7.5	Fill	0
Building A (Headworks & Dewatering)	1.5 (e.g., at-grade)	P-04, P-05	3.5 to 7.5	Fill	0

Notes:
1. Bottom depths for structures based on 90 percent submittal plans provided by West Yost.
2. The approximate southern half of the IPS will be supported on a slab-on-grade and the approximate northern half of the IPS will be founded below grade at about 26.2 feet bgs.
3. The MEB building will be an at-grade structure and built on approximately 5 feet of new fill.
4. Only to foundation bottom elevation; likely additional excavation required below for piping, leveling course, etc.

6.2.1 Subgrade Preparation

Satisfactory subgrade support for spread footings or mat and slab-on-grade foundations associated with the proposed at-grade structures can be obtained by over-excavating a minimum of 3 feet of the undocumented fill materials and replacing it with properly placed and compacted structural fill. For the on-grade portion of the IPS and MEB Building, complete over-excavation of the undocumented fill and replacement with compacted structural fill are recommended. All granular pads for footings should be constructed a minimum of 6 inches wider on each side of the footing for every vertical foot of over-excavation. The geotechnical engineer or his representative should be contacted to observe subgrade conditions prior to placement of forms, reinforcement steel, or structural fill.

For any at-grade structure excavation that reaches bedrock, see Section 6.1.1 for subgrade preparation for bedrock surfaces.

6.2.2 Minimum Footing Width & Embedment

Minimum spread footing widths should be in conformance with the current OSSC. As a guideline, we recommend individual spread footings have a minimum width of 24 inches, and continuous wall footings have a minimum width of 18 inches. All footings should be founded at least 18 inches below the lowest permanent adjacent grade to develop lateral capacity and for frost protection.

6.2.3 Bearing Pressure & Settlement

Spread footings associated with at-grade structures founded as recommended in Section 6.2 should be proportioned for a maximum allowable bearing pressure of 2,000 pounds per square foot (psf). This bearing pressure is a net bearing pressure, applies to the total of dead and long-term live loads, and may be increased by one-third when considering seismic or wind loads.

For spread footings associated with at-grade structures founded as recommended in Section 6.2.1, we estimate total static settlements to be 1 inch or less, with differential settlements between adjacent columns and/or bearing walls on the order of 0.5 inch or less.

6.2.4 Design Parameters for Mat Foundations and Floor Slabs

For the recommended minimum 36-inch-thick layer of imported structural fill (including leveling course) overlying the undocumented fill materials, we recommend a maximum modulus of vertical subgrade reaction of 175 pounds per cubic inch (pci) be used for design of mat foundations and floor slabs. The subgrade modulus values represent anticipated values, which would be obtained in a standard in situ plate test with a 1-foot square plate. Use of this subgrade modulus for floor slab design should include appropriate modifications based on dimensions as necessary.

6.3 Foundation Recommendations for Sludge Blend Tank and Digested Sludge Holding Tank

We recommend the upper 5 feet of undocumented fill materials be removed (i.e., over-excavation of 3.5 feet) to construct a crushed rock mat section to support the Sludge Blend Tank and Digested Sludge Holding Tank. The crushed rock mat section is shown in Figure 8. Subgrade areas should be cleanly cut to firm undisturbed soil. Additional over-excavation may be required locally, especially if organic materials, construction debris, or other unsuitable materials are encountered.

Once the upper 5 feet of undocumented fill materials have been removed, the exposed subgrade surface should be rolled with a self-propelled, smooth-drum compaction equipment to recompact the subgrade to at least 92 percent of ASTM D1557. The over-excavation and subgrade compaction should be observed by a representative of the geotechnical engineer.

After the over-excavation and subgrade is approved, a strong geotextile, such as Mirafi RS580i that provides both separation/filtration and reinforcement, should be installed directly on the prepared subgrade. The overlap of the geotextile should be at least 2 feet.

After the placement of the geotextile, construction of the crushed rock mat section should follow immediately to protect the prepared subgrade. The reinforcement geotextile should consist of two layers of Mirafi RS580i (or its equivalent). The overlap of the geogrid should be at least 2 feet. The first layer of geogrid should be placed directly on the prepared subgrade, and the second layer should be at 3 feet above the first layer.

Fill materials used in the crushed rock mat section should be clean, 1½-inch minus Dense Graded Aggregates structural fill (see Section 7.6.2 for additional recommendations) and should be compacted to 92 percent of ASTM D1557. The 1½-inch minus structural fill should be placed in maximum lifts of 12 inches of loose material and should be placed such that construction equipment does not operate directly on the geotextile and rock spread such that the geotextile is not damaged or pulled apart at joints. Each lift of subgrade stabilization material should be tested by an experienced geotechnical engineering representative prior to placement of subsequent lifts.

6.4 Retaining Walls

There are six retaining walls, Wall 1 through Wall 6, proposed as part of the WRF improvements. The retaining walls will be cast-in-place, reinforced concrete cantilevered walls ranging in height from 2.5 to 6.75 feet and with footing widths ranging from 3 feet to 6 feet. The retaining walls will retain backfill heights ranging from 2 feet to 6.25 feet. We understand the retaining walls are being designed by West Yost.

The following sections and information in this report should be referenced, regarding to the design and construction of the retaining walls:

- Lateral earth pressure recommendations provided in Table 6-3;
- Retaining wall footing design and subgrade preparation should be in general accordance with Sections 6.2.1, 6.2.2, and 6.2.3 of this report;
- Lateral/sliding resistance recommendations are provided in Section 6.6; and
- Retaining wall backfill recommendations are provided in Section 7.6.3.

6.5 Uplift & Flotation Considerations

6.5.1 Below Grade Structures

Below-grade, water-tight structures should be designed to resist uplift forces during periods of high groundwater. Forces resisting uplift include self-weight of the structure and one of following two options for backfill soils. The selection depends on the geometry of the foundation behind the embedded walls:

1. When the foundation wall includes a perimeter lip (or heel) extending beyond the back face of the foundation wall, the self-weight of a soil wedge can be included. The wedge is defined by the area from the back face of the foundation wall to a plane projected upwards from the heel of the footing at an angle of 20 degrees outward from vertical. An average soil unit weight of 120 pcf

above the design groundwater level is recommended for this evaluation. A buoyant soil unit weight of 70 pcf should be used below the design groundwater level.

2. When the foundation wall *does not* include a heel, shear resistance should be evaluated using a friction coefficient of 0.4 between the structure wall and backfill in conjunction with the at-rest lateral earth pressure distribution provided in Figure 4.

A schematic showing these buoyancy resistance options is provided in Figure 5. For the evaluation of buoyancy, a design groundwater level at the ground surface is recommended. This is due, in part, to the potential for water to collect in the wall backfill and subgrade. Although water will likely dissipate into the formation, the dissipation rate may be slower than the collection rate, leading to temporary hydrostatic and uplift pressures below structure foundations.

However, this uplift resistance by either frictional or weight approach may not be sufficient due to the large footprints of some of the structures (e.g., the SC90, Aeration Basin No. 3, and Primary Clarifier structures), or structurally unfavorable for the base slab design. In this case, an underdrain system and/or pressure relief valves may need to be considered. If an underdrain system is to be considered during design, we recommend that the system consist of an 18-inch-thick layer of drain rock overlain by 6 inches of leveling course below the foundations and slabs, with 4-inch diameter perforated pipes located at the mid-height of the drainage layer. The pipes should be connected to a manhole with a pump system. The pump system can be turned on prior to maintenance for hydrostatic pressure relief and dewatering. The underdrain system can also be used as leak detection system under structures. A typical underdrain system is shown in Figure 6. More details about the underdrain system should be provided in the project plans and specifications if an underdrain system is to be utilized.

6.5.2 Pipeline Structures

Since the ground water level (modeled at the ground surface) is above the proposed pipeline structures, a check against buoyancy of the empty pipe was performed. We calculated a Factor of Safety (FOS) against flotation based on the most conservative buried pipe structure case (the 24-inch diameter RS IPS to Headworks HDPE pipeline with 3 feet of pipe cover). Our calculations showed a FOS greater than 3.5 for this buried pipe case. Therefore, we conclude that the potential flotation risk of buried pipeline structures is low.

Although the FOS against floatation is acceptable for the above, worst-case scenario, there are typically minimum depth of cover requirements to protect pipelines from traffic and structural surcharge loading. Therefore, construction live load and traffic load during the project life should be considered in the design.

6.6 Lateral Earth Pressures – Embedded Walls & Retaining Walls

Backfill material placed behind the below-grade structures, vaults, ancillary structures, as well as the proposed retaining walls should consist of free-draining crushed aggregate conforming to Section 00510.12 in the most recent OSSC. We recommend using a high groundwater level at the site ground surface in the calculation of lateral earth pressures for embedded walls. Table 6-3 summarizes our recommended lateral earth pressure values, expressed as the equivalent fluid pressures.

Table 6-3. Recommended Lateral Earth Pressures

Design Condition	Groundwater Condition	Static At-rest Pressure (psf)	Static Surcharge Pressure (psf)	Additional Seismic Pressure (psf)	Hydrostatic Pressure (psf)
At-Rest Earth Pressure	Above Groundwater	$50(H-H_W)$	0.4q	17H	--
	Below Groundwater	$50(H-H_W) + 28H_W$	0.4q	17H	$62H_W$
Active Earth Pressure	Above Groundwater	$29(H-H_W)$	0.22q	10H	--
	Below Groundwater	$29(H-H_W)+16H_W$	0.22q	10H	$62H_W$

General Notes:
1. H = total height of buried wall.
2. H_W = submerged portion of buried wall

Our recommended lateral earth pressures assume imported, free-draining crushed aggregate and finished backfill slopes flatter than 4H:1V (horizontal:vertical). The equivalent fluid earth pressures and seismic earth pressures increase with depth in a hydrostatic, triangular pressure distribution with the resultant force acting at approximately 0.3H above the base of the wall (where H is the total height of the wall). The pressure distribution of the surcharge loads is a constant value of lateral pressure resulting from the vertical, surface surcharge loads (q) with the resultant lateral surcharge force acting approximately at a height above the base of the wall equal to one-half the total wall height. Walls that extend below the anticipated high/perched groundwater level of 2.5 feet bgs should also include the hydrostatic groundwater loading. The distribution and resultant of the backfill, groundwater, and seismic earth pressure are shown on Figure 4.

6.7 Lateral Resistance – At-Grade and Below-Grade Structures

Lateral resistances for at-grade and below-grade structures can be provided by frictional resistance between the base of the foundation and the crushed rock/structural fill material, and through soil passive resistance around the embedded portion of the structure for below-grade structures. For base frictional resistance, an allowable friction factor of 0.60 for cast-in-place concrete foundations on the crushed rock/structural fill material may be used, and an allowable friction factor of 0.40 for pre-cast concrete foundations on the crushed rock/structural fill material may be used.

The design value for passive pressure should not exceed the value of 150D (in units of psf, where D is the depth of the embedment), due to the large amounts of movement necessary to mobilize full passive resistance. This value incorporates a factor of safety (FOS) of 3 from the ultimate value. Unless in paved areas, the upper 12 inches should not be used in calculating passive resistance because construction and post-construction activities often disturb this region.

6.8 Pipeline Structures

6.8.1 Pipeline Subgrade Support

The subgrade along the pipelines is anticipated to consist of basalt or fill materials (i.e., soft clayey soil, or very loose silty sand). Basalt will support the pipeline without any modifications. For areas where the trench subgrade consists of soft subgrade conditions, we recommend subgrade stabilization in general accordance with Section 7.6.6. The new pipeline construction will not result in a net increase in pressure at the base of the pipeline, and therefore pipe settlement under static conditions is expected to be negligible.

6.8.2 Pipe Zone Geotechnical Design Parameters

Flexible pipes derive their load carrying capacity from their interaction with the pipe zone backfill as the pipe deflects under load and pushes laterally against the soil. Load carrying capacity depends on the depth of the pipe, the surrounding soil conditions, the type and density of the backfill, and the thickness of compacted pipe zone backfill between the pipe and the native soil/rock in the trench wall. Based on the anticipated subsurface soil types and relative densities, we have developed the following geotechnical design parameters to be used for pipeline design.

Table 6-4. Pipeline Design Parameters

Property	Undocumented Fill Soils	Basalt Bedrock	Granular Backfill	CLSM
Moist Unit Weight, γ_m (pcf)	115	165	135	125
Saturated Unit Weight, γ_{sat} (pcf)	120	165	140	125
Friction Angle, ϕ (degrees)	30	45	38	34
Modulus of Soil Reaction, E' (psi)	700	>10,000	2400	3,000

The design parameters presented in Table 6-4 are appropriate for use in the Iowa Deflection formula (Spangler, 1941) and are consistent with American Water Works Association Manual M11 (2004).

6.8.3 Trench Width

Distance between the pipe springline and trench sidewall should be wide enough to allow for inspection, adequate backfill compaction, and field density testing. For granular backfill the minimum distance between the pipe springline and the trench sidewall should be as follows:

- Pipe diameter ≥ 36 inches: 18 inches
- Pipe diameter <36 inches and ≥ 24 inches: 12 inches
- Pipe diameter <24 inches: 9 inches

Where Controlled Low Strength Material (CLSM) is used as backfill, the trench width should extend a minimum 9 inches beyond the pipe springline for pipes with diameters greater than 36 inches. For pipes

with diameters smaller than 36 inches, the trench width should extend a minimum 6 inches beyond the pipe springline.

6.8.4 Pipeline Backfill Material

We recommend that the pipe bedding and pipe zone in the trench be constructed with imported, well-graded crushed rock, such as ¾- inch minus crushed aggregate conforming to Section 02630.10 in the most recent OSSC.

7.0 Construction Recommendations

Recommendations provided herein are for planning purposes. We assume that we will be provided an opportunity to complete our recommendations once the project details are finalized. All specifications referenced in this section referred to 2021 Oregon Standard Specifications for Construction (ODOT, 2021). We recommend completing the construction during dry season when the groundwater is at the lowest.

7.1 Site Preparation

All areas to be excavated, filled, or used as a subgrade should be stripped. Prior to stripping and excavation, utilities should be located and rerouted as necessary, and any abandoned pipes or utility conduits should be removed or stabilized in a manner that does not adversely affect performance of new facilities. Demolition of any existing buildings and foundations associated with former structures should include complete removal of all structural elements, including foundations and concrete slabs. Although we anticipate that a majority of the subgrade supporting the proposed improvements will consist of basalt bedrock, the following paragraphs are applicable to those areas in which subgrade conditions will consist of the existing, on-site undocumented fill materials (i.e., pavement/hardscaping areas, etc.).

Due to the moisture-sensitive nature of the existing on-site fill materials, all stripping and excavations should be performed using a smooth-edge excavator working from areas where material has yet to be removed. Stripping and excavation should remove surficial organic soil (sod and topsoil), trees/roots, asphalt pavement and base rock, and any loose/soft materials as determined by a qualified geotechnical engineering representative. Subgrade areas should be cleanly cut to firm, undisturbed soil. Should construction take place during wet weather, we recommend that a representative of the geotechnical engineer be present to observe the subgrade in order to evaluate whether additional preparation is indicated.

Placement of crushed rock should follow immediately after site grading in order to provide protection of the sensitive subgrade soil during construction activities. In temporary construction traffic areas, the placement of a 12-inch-thick granular working base is generally recommended. For heavily traveled construction traffic areas, thicker sections (i.e. 18 to 24 inches) and geotextile fabrics are recommended. Generally, four to six inches of crushed rock is sufficient in foot traffic areas.

7.2 Excavation

The site is underlain by fill, extending from the ground surface to depths ranging from 2.0 to 16.5 feet bgs. The fill is underlain by strong to very strong (R4 to R5) basalt. We anticipate that maximum excavation depths for the proposed improvements will be on the order of 20 feet bgs. Therefore, rock excavation will be required.

Rippability is the ease with which rock can be mechanically excavated, and it is influenced by numerous rock parameters, including unconfined compressive strength, degree of weathering, fracturing, abrasiveness, and spacing of discontinuities. Uniaxial compressive strength test results of the basalt bedrock ranged from 7,000 to 26,000 psi, with an average value of 19,000 psi. The results of Point Load

Index ($I_{S(50)}$) testing ranged from approximately 270 and 715 psi, with an average value of 510 psi, which correlate to uniaxial compressive strengths of approximately 5,100 to 17,150 psi. The results of strength tests, in conjunction with observed joint spacing and degree of weathering indicate the rock is not rippable by typical construction equipment. Therefore, rock excavation will likely require drilling and blasting.

The contractor should be responsible for selecting appropriate rock excavation techniques that prevent damage to existing facilities and minimizes over-break or over-cut beyond the excavation limits. Protruding rock of more than 4 inches above the specified subgrade elevation should not be allowed. Any large protrusions should be removed. In addition, the selection of excavation methods and procedures should consider the impact to the subgrade preparation.

7.3 Temporary Excavation Support

All excavations should be in accordance with applicable OSHA and state regulations. It is the contractor's responsibility to select the excavation methods, to monitor site excavations for safety, and to provide any shoring required to protect personnel and nearby, existing structures. A competent person, as defined by Oregon OSHA, is an individual that can identify existing and predictable excavation-related hazards and has the authority to take prompt corrective measures to eliminate such hazards. McMillen Jacobs' Project role does not include review or oversight of excavation safety. As summarized in Table 6-1, the base depths of the proposed below-grade structures are up to about 26 feet below existing site grades and may require excavation depths on the order of up to 30 feet.

Due to the depth of the proposed structures, depth to groundwater, and site restraints, temporary excavation support will likely be required for some excavations within the existing fill. For excavations extending into basalt bedrock, the rock can be cut at slopes as steep as vertical. For the undocumented fill materials, an OSHA soil type of "C" should be used; with a maximum allowable temporary cut slop of 1.5H:1V (horizontal:vertical) if fully dewatered.

Our opinions for the excavation support discussed above are for planning purposes only. The contractor should be responsible for the stability of temporary excavations and the actual means and methods to protect excavations and that temporary slopes comply with applicable local, state, and federal safety regulations, including the current Occupational Safety and Health Administration (OSHA) Excavation and Trench Safety Standards. Lateral earth pressures for design of the temporary excavation support within fill are provided in Figure 7.

7.4 Groundwater Control

Groundwater measurements made during explorations indicate groundwater levels between 2.5 and 8.5 feet bgs across the site. Groundwater levels during construction may be higher than these, especially during the wet seasons. Excavations for structures are anticipated to extend to approximately 20 feet below the ground surface. Therefore, the excavations will encounter groundwater.

Soil within the excavations are primarily fine-grained with isolated zones of sandy soils. These materials are not anticipated to produce significant volumes of water. However, due to the size of the work area and

shallow groundwater, it is anticipated that dewatering systems including sump-pumps or well points may be required.

7.5 Blasting Plan

Based on the conditions encountered in the borings, the contractor may select to use drilling and blasting methods for excavation. The drilling and blasting must conform to the requirements in Section 00335 of the most recent OSSC. The Contractor must submit a blasting plan prepared by a person qualified and experienced in blasting work at least 14 days before beginning of drilling and blasting work. The blasting plan must provide details of drilling and blasting pattern, vibration, flyrock, noise reduction method, blast area security measures, and traffic control.

Drilling and blasting activities generate vibrations. Blast designs must be developed to limit vibrations to levels that do not adversely influence existing nearby structures. Blast designs involve interrelated parameters including round length, blast hole size, spacing, location, explosive strength, and the delay and firing sequence. Delays are used to detonate fractions of seconds after blast initiation to make sure each charge will fire into a cavity created by an earlier charge.

If blasting is used, nearby structures should be pre-surveyed for documenting the existing conditions. Seismographs that are specifically designed to monitor construction blasting should be used during construction to monitor blast vibrations to verify that actual vibration levels are within an acceptable range at critical structures. If a blast results in unacceptable vibrations, special modifications to the blasting procedures should be made, such as using different delay patterns, reduction in size of individual blasts, shorter and/or smaller diameter blast holes, closer spacing of blast holes, reduction of explosives, or a combination thereof as necessary to improve results.

7.6 Fill Materials & Compaction Criteria

We anticipate that various fill materials will be used for the construction of this project and that their specific locations and placement criteria will be described in the construction plans and specifications. The following sections describe general fill criteria that are subject to modification under specific design recommendations and the development of construction plans and specifications.

7.6.1 On-Site Soils – General Use

The on-site fill materials are not suitable for re-use as structural fill, though they may be separated and stockpiled for use in non-structural or appropriate landscape applications.

7.6.2 Imported Structural Fill – General Use

Imported structural fill should conform with the requirements of ODOT 1½-inch or ¾-inch minus Dense Graded Aggregates as defined in Section 02630-10.

Imported structural fill should be placed in maximum lifts of 8 inches of loose material. Unless otherwise noted, structural fill should be compacted to 92 percent of ASTM D1557 (i.e., Modified Proctor). Proper moisture conditioning and the use of vibratory equipment will facilitate compaction of these materials.

Each lift of imported structural fill should be tested by a qualified testing agency prior to placement of subsequent lifts. This fill condition should extend horizontally outward beyond the exterior perimeter of the building and footings a distance equal to the height of the fill or 3 feet, whichever is greater.

7.6.3 Embedded Wall & Retaining Wall Backfill

Embedded wall and retaining wall backfill (wall backfill) should consist of should consist of free-draining crushed aggregate conforming to Section 00510.12 in the most recent OSSC and be compacted to a minimum of 90 percent of the maximum dry density, as determined by ASTM D 1557. Wall backfill placed within 3 feet of the wall should be compacted in lifts less than 6-inches thick using hand-operated tamping equipment (e.g., jumping jack or vibratory plate compactors). If flat work (e.g., sidewalks or pavements) is placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to 95 percent of the maximum dry density, as determined by ASTM D 1557.

7.6.4 Bedding and Pipe Zone Backfill

We recommend that pipe bedding consist of imported structural fill as described above, such as ¾-inch minus crushed aggregate base material. We recommended a minimum 6 inches of bedding below the invert of the pipe. If weak subgrade conditions are encountered, subgrade stabilization may be necessary, as discussed in Section 7.6.6.

Above the pipe bedding zone, an imported structural fill as described above should be used for the pipe zone which typically extends at least 12 inches above the top of the pipe, or as determined by West Yost or the pipe manufacturer.

Bedding and pipe zone materials should be compacted to 90 percent of the maximum dry density, as determined by ASTM D 1557.

7.6.5 Trench Backfill

Trench backfill above the pipe zone should consist of imported structural fill as described above, with a maximum particle size of ¾ inch, and with less than 8 percent material passing the U.S. Standard No. 200 Sieve. As a guideline, trench backfill should be placed in 12- to 18-inch lifts. The earthwork contractor may elect to use alternative lift thicknesses based on their experience with specific equipment and fill material conditions during construction in order to achieve the required compaction. Trench backfill materials should be compacted to 95 percent of the maximum dry density, as determined by ASTM D1557.

7.6.6 Subgrade Stabilization

If groundwater is present at the base of utility excavations, trench base stabilization material should be placed. Trench base stabilization material should consist of a minimum of 12 inches of well-graded granular material (with a maximum particle size of 3 inches and less than 5 percent material passing the U.S. Standard No. 4 Sieve) underlain by a layer of non-woven geotextile placed directly over the subgrade. The material should be free of organic matter and other deleterious material, placed in one lift, and compacted until well keyed. Vibratory compaction equipment is not recommended due to risk of

additional disturbance to the subgrade. A reinforcement geotextile should be used below the aggregate as described in Section 7.7.2.

7.6.7 Controlled Low-Strength Material (CLSM)

CLSM is a self-compacting, cementitious material that is typically considered when backfilling localized areas. CLSM is sometimes referred to as "controlled density fill" or CDF. Due to its flowable characteristics, CLSM typically can be placed in restricted-access excavations where placing and compacting fill is difficult. If chosen for use at this site, we recommend the CLSM conform with Section 00442 in the most recent OSSC. The geotechnical engineer's representative should observe placement of the CLSM and obtain samples for compression testing in accordance with ASTM D4832. As a guideline, for each day's placement, two compressive strength specimens from the same CLSM sample should be tested. The results of the two individual compressive strength tests should be averaged to obtain the reported 28-day compressive strength. If CLSM is considered for use on this site, please contact the geotechnical engineer for site-specific and application-specific recommendations.

7.6.8 Pavement Materials – Asphalt & Base Course

Asphalt pavement and base course materials should conform to the requirements set forth in the most recent Oregon SSC guidelines. Base course material should consist of a well-graded, 1½-inch or ¾-inch-minus, crushed rock, having less than 5 percent material passing the No. 200 sieve. Base course material should be moisture conditioned to within 2 percent of optimum moisture content and compacted by mechanical means to a minimum of 95 percent of the material's maximum dry density, as determined in accordance with ASTM D 1557. Base coarse materials should be placed in layers that, when compacted, do not exceed about 8 inches. The asphalt pavement should be compacted to at least 92 percent of the material's theoretical maximum density as determined in accordance ASTM D 2041 (Rice Specific Gravity).

7.7 Geotextiles

7.7.1 Separation Geotextiles

In general, the widespread use of separation geotextiles is not anticipated for the project. However, they may be required in localized areas of trench seepage or for protection of subgrade, or in other areas identified during construction. They are not required for typical trench construction. If used, separation geotextiles should consist of a "needle-punched", non-woven separation fabric meeting the requirements for nonwoven drainage geotextiles, as shown in Table 02320-4 in OSSC Section 02320.

7.7.2 Reinforcement Geotextiles

A reinforcement geotextile system should be installed beneath subgrade stabilization backfill within the pipeline trenches. We recommend a single-layer system consisting of a strong geotextile, such as Mirafi RS380i, that provides both separation/filtration and reinforcement. The reinforcement/separation geotextile should be installed on the base of the trench and extend up to the top of the subgrade stabilization zone (below bedding) at a minimum. Reinforcement geotextiles should meet the requirements for Type 2, woven riprap geotextiles, as shown in Table 02320-2 in ODOT OSSC Section 02320 (ODOT, 2021).

For construction of the crushed rock mat section to support the Sludge Blend Tank and the Digested Sludge Holding Tank, we recommend using the Mirafi RS580i geotextile, which is very similar to the Mirafi RS380i discussed above, but has a higher tensile strength and modulus.

7.8 Wet Weather Construction

For planning purposes, the wet season should be considered to extend from late September to late June. It is our experience that dry weather working conditions should prevail between early July and the middle of September.

The soils encountered within the project area are highly moisture sensitive and will degrade after being traversed by construction equipment during periods of wet weather or wet conditions. Therefore, during or after wet weather, it will likely be necessary to import granular materials for structural fill or to protect exposed subgrade materials. Delays in site earthwork activities should be anticipated during periods of heavy rainfall. If earthwork is performed during extended periods of wet weather or in wet conditions, we recommend the following:

- Cover the base of trenches within soil with trench stabilization material.
- Excavations should be protected from surface water runoff by placing sandbags or by other means to promote runoff of precipitation away from work areas and to prevent ponding of water in excavations.
- Plastic covers, sloping, ditching, sumps, dewatering, and other measures should be employed in work areas as necessary to permit timely completion of work. Bales of straw and/or geotextile silt fences should be used to control surface soil movement and erosion.
- Excavations (specifically trench excavations) should be completed in small sections and backfilled at the end of each day to reduce exposure to wet conditions.
- Excavation or the removal of unsuitable soil should be followed promptly by placement and compaction of trench or foundation stabilization fill.
- The size and type of construction equipment used may have to be limited to minimize soil disturbance.

8.0 Closure

This report has been prepared for the exclusive use of the City of Sweet Home and West Yost Associates, Inc. in connection with the Sweet Home Wastewater Treatment Plant – Final Design project. The data presented in this report is based on the subsurface conditions encountered during our site explorations. The data presented herein is intended to support the design of the proposed improvements. McMillen Jacobs Associates is not responsible for the interpretation of the data contained in this report by anyone; as such interpretations are dependent on each person's subjectivity.

The geotechnical engineering evaluations and interpretations are completed within the limitations of McMillen Jacobs Associates approved scope of work, schedule and budget. The services rendered by McMillen Jacobs Associates have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same area. The construction recommendations are considered preliminary and provided for planning purposes only. McMillen Jacobs Associates is not responsible for the use of this report in connection with anything other than the project at the location described above.

MCMILLEN JACOBS ASSOCIATES



Wolfe Lang, P.E., G.E.
Principal Geotechnical Engineer

Jeff Quinn, P.E.
Senior Project Engineer

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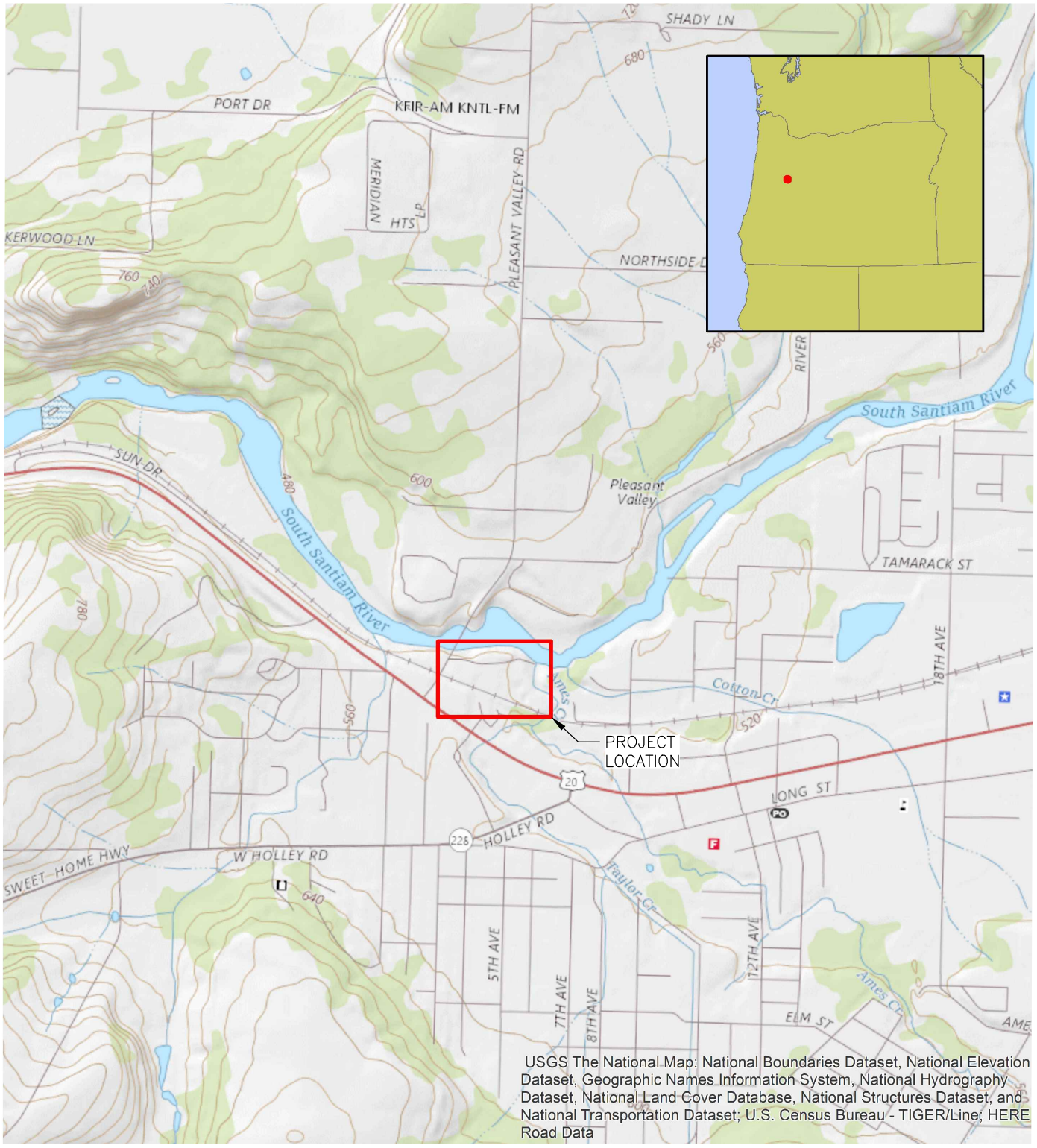
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Figures



PROJECT VICINITY MAP

SCALE: NTS

N

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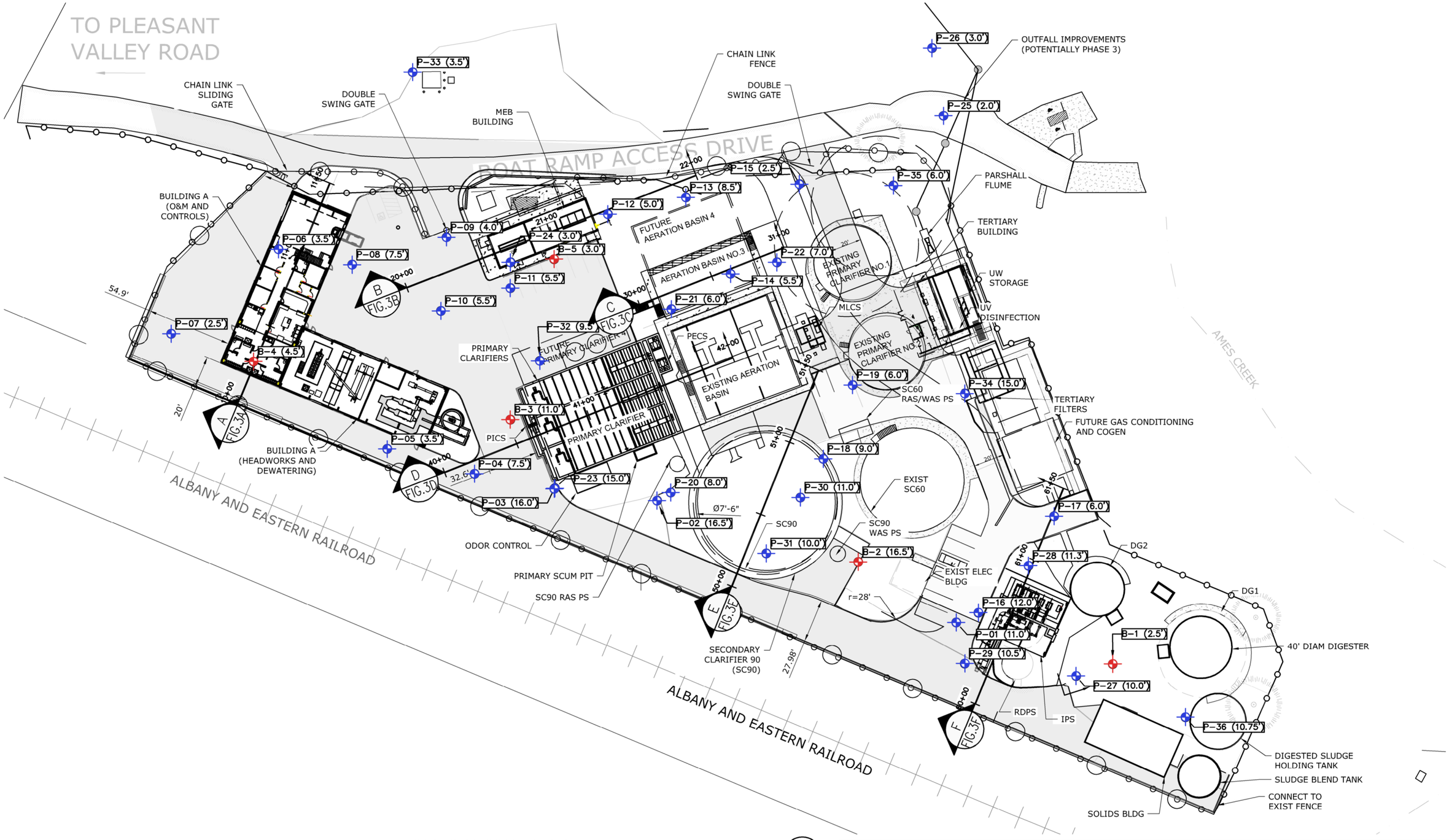
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
PROJECT VICINITY MAP

FIG.1

DEC 2022

Path: C:\Users\cburke\Box\Jobs\6367.0 Sweet Home WWTP Final Design Review\900 Design Technology\970_Xrefs\Fig.1 – Vicinity map.dwg Plot date: Jul 21, 2022, CAD User: cburke



LEGEND:

B–1 (XX.X') BOREHOLE LOCATION (DEPTH TO ROCK IN FT)

P–01 (XX.X') PROBE–HOLE LOCATION (DEPTH TO ROCK IN FT)

EXPLORATION PLAN

SCALE: 1"=60'

0' 60' 120'

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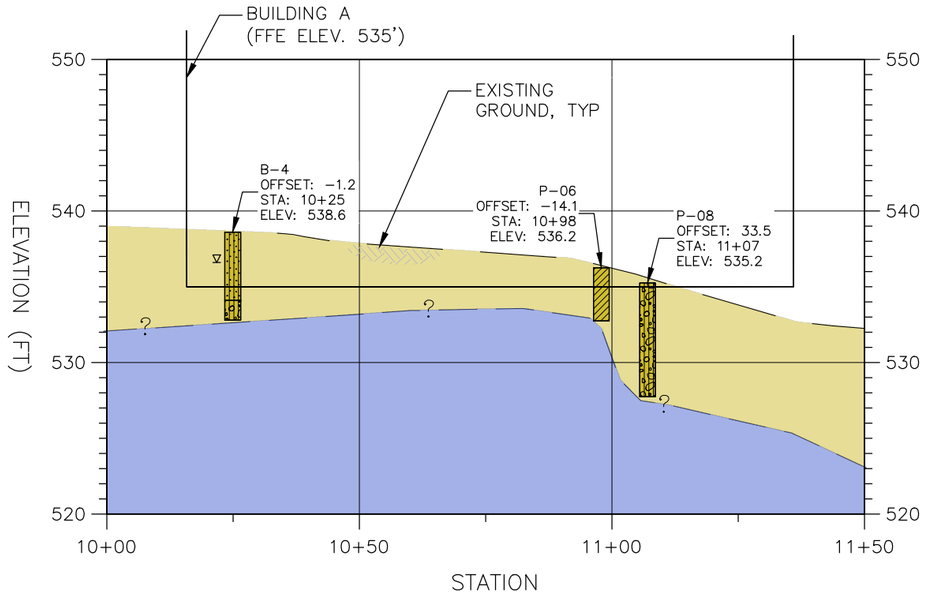
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
EXPLORATION PLAN

FIG.2

DEC 2022

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GEOLOGIC PROFILE STA 10+00 TO 11+50

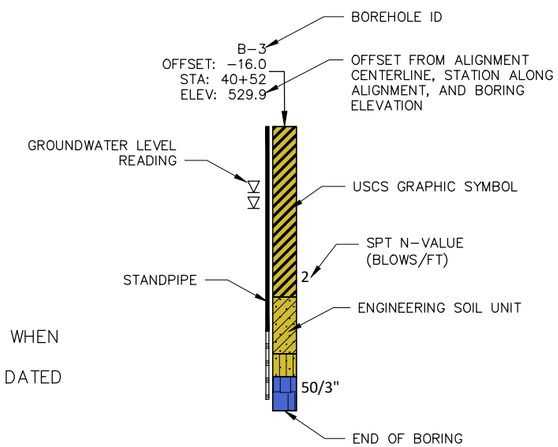
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

1. BOREHOLE LOCATIONS ARE APPROXIMATE.
2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

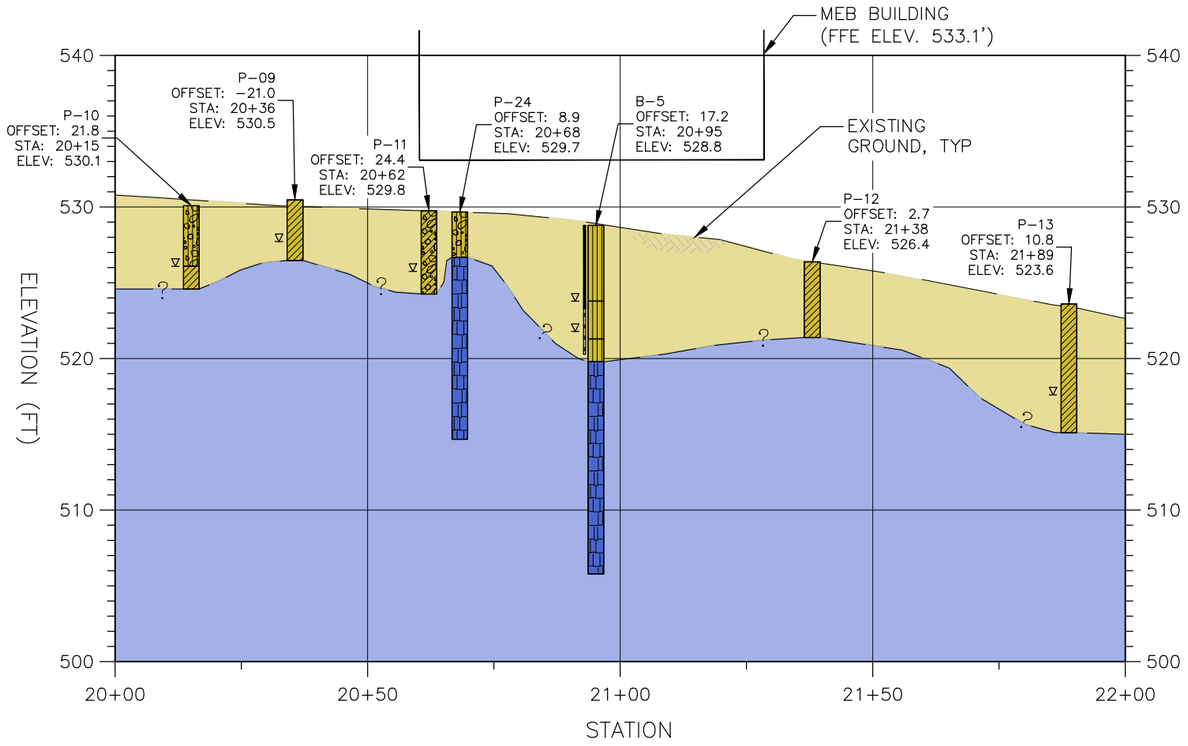
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
BUILDING A

FIG.3A

DEC 2022

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GEOLOGIC PROFILE STA 20+00 TO 22+00

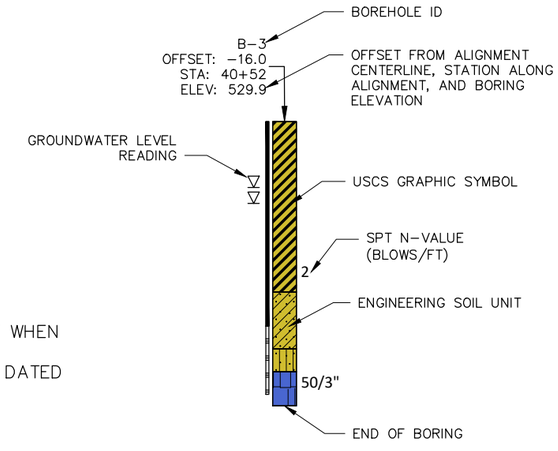
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

B
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

1. BOREHOLE LOCATIONS ARE APPROXIMATE.
2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

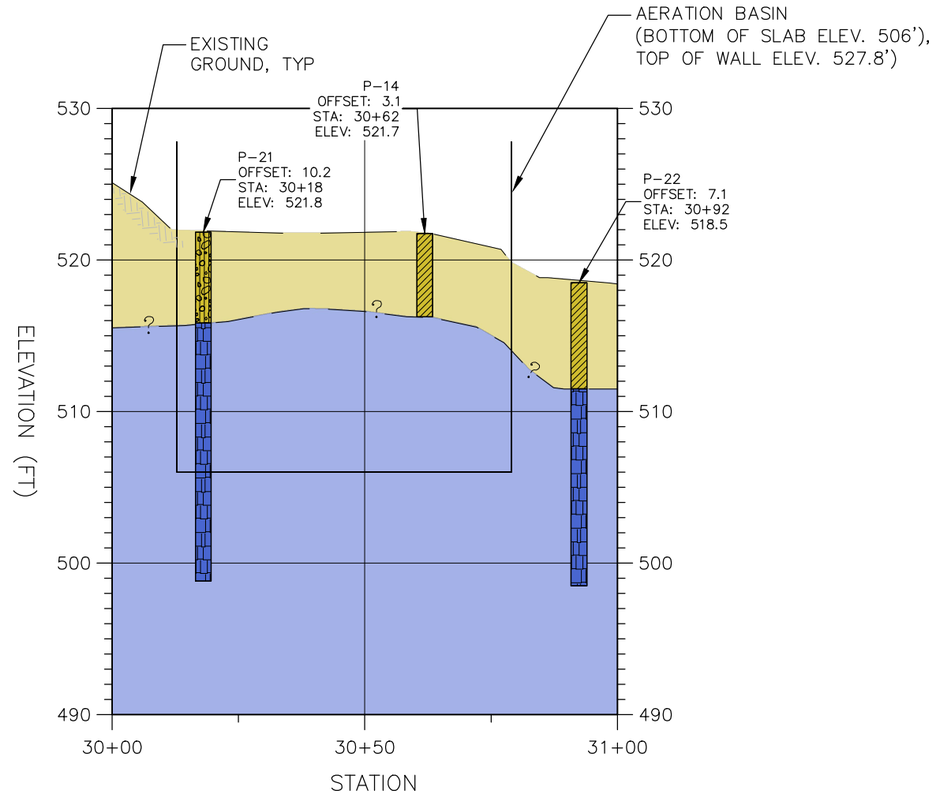
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
MEB BUILDING

FIG.3B

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GEOLOGIC PROFILE STA 30+00 TO 31+00

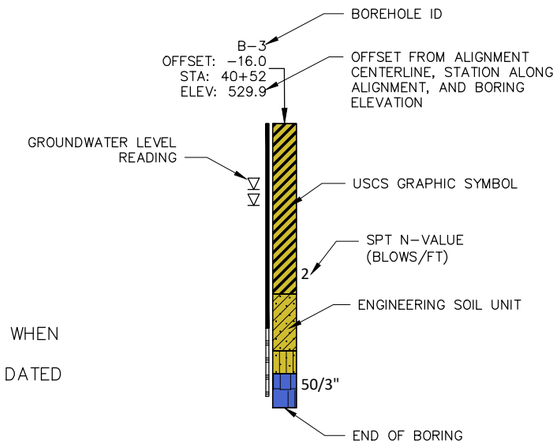
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

C
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

1. BOREHOLE LOCATIONS ARE APPROXIMATE.
2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

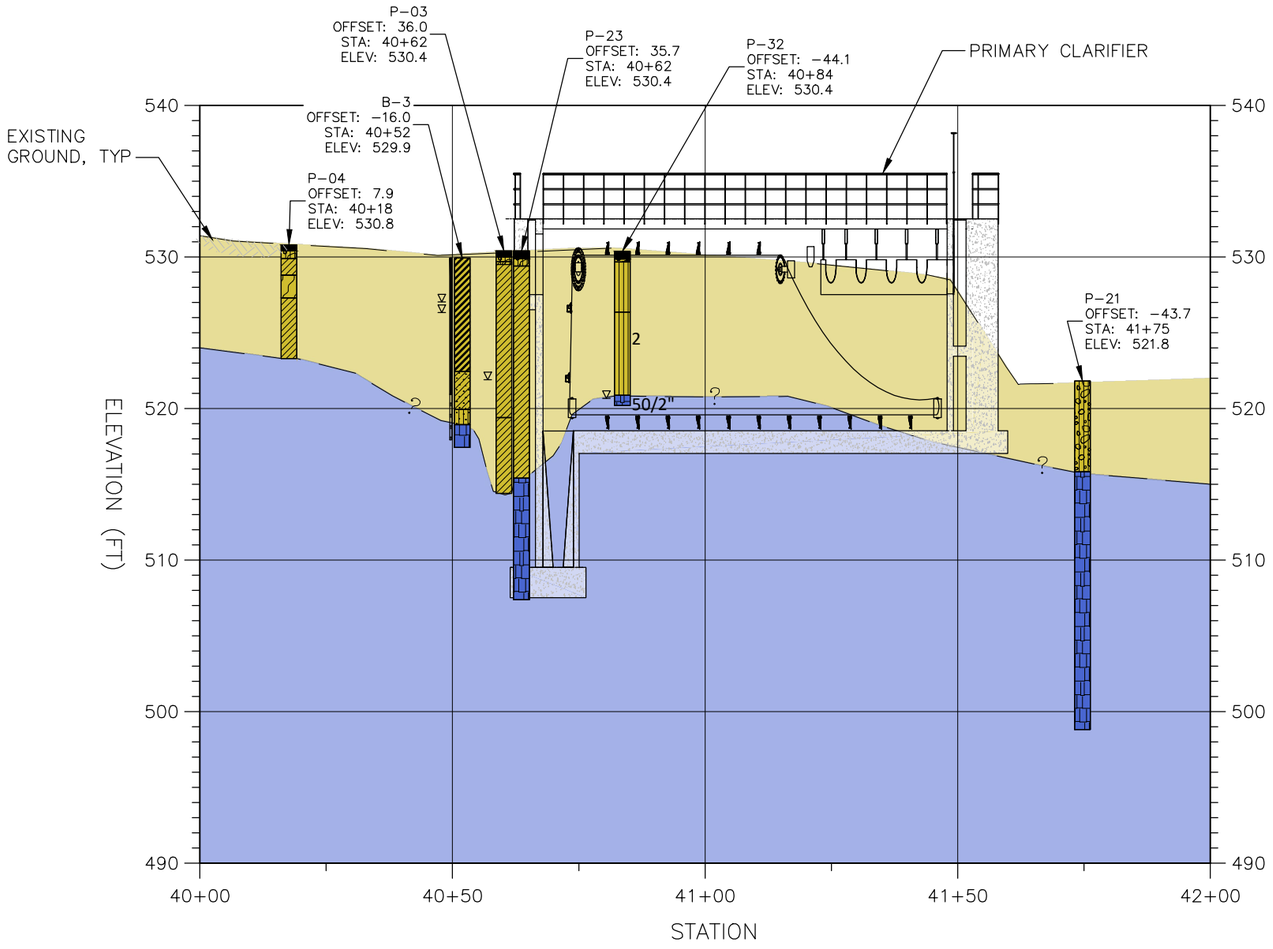
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
AERATION BASIN NO. 3

FIG.3C

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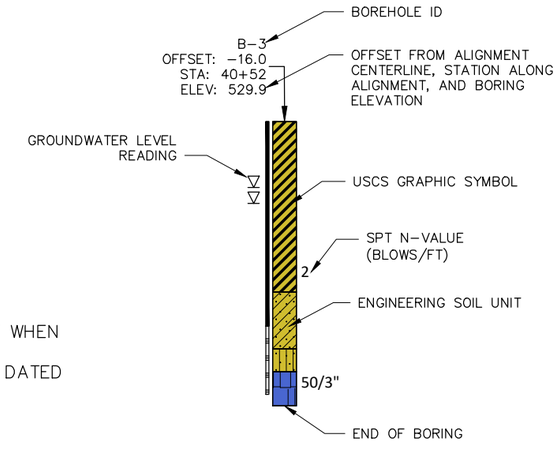
GEOLOGIC PROFILE STA 40+00 TO 42+00

SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'
0' 10' 20'

D
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

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2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

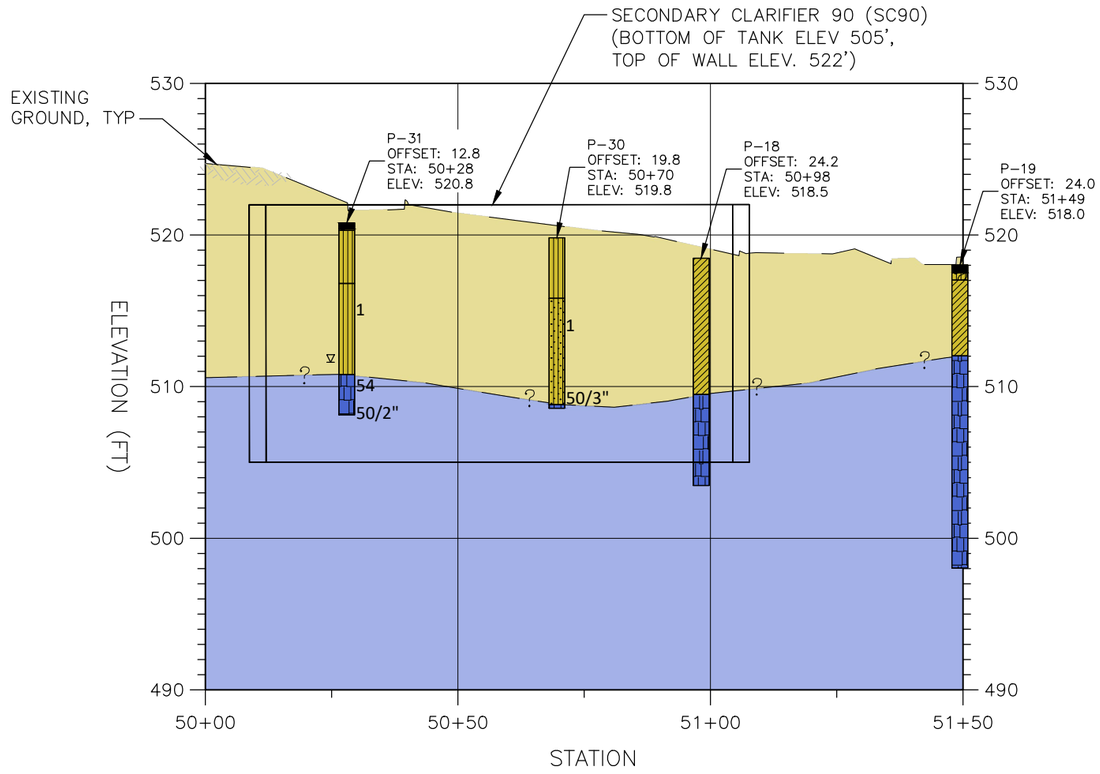
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
PRIMARY CLARIFIER

FIG.3D

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GEOLOGIC PROFILE STA 50+00 TO 51+50

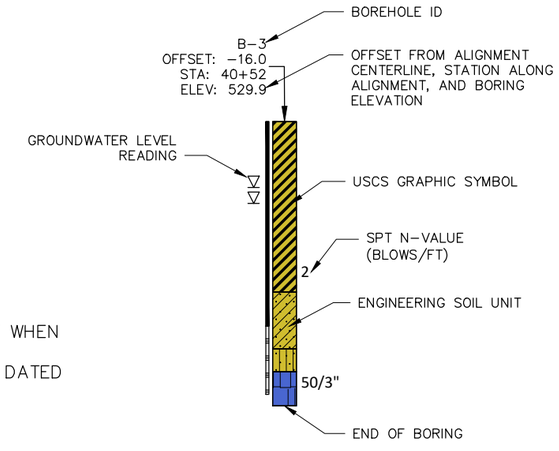
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

E
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

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McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

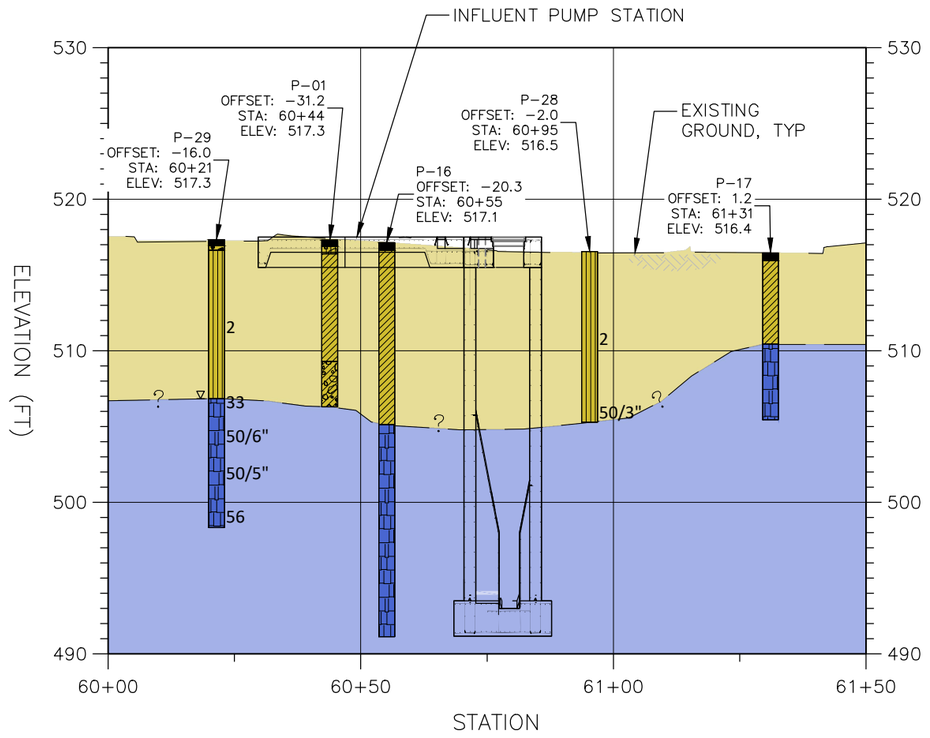
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
SECONDARY CLARIFIER 90 (SC90)

FIG.3E

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GEOLOGIC PROFILE STA 60+00 TO 61+50

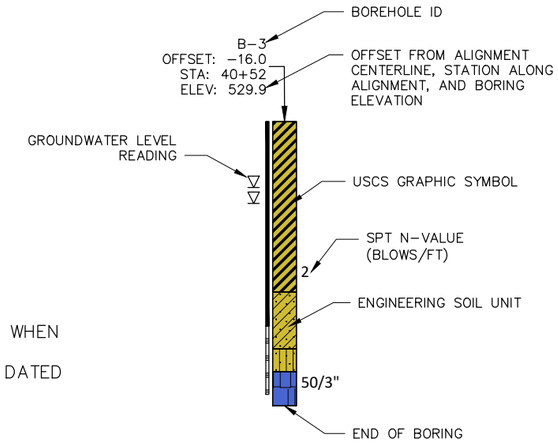
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

F
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

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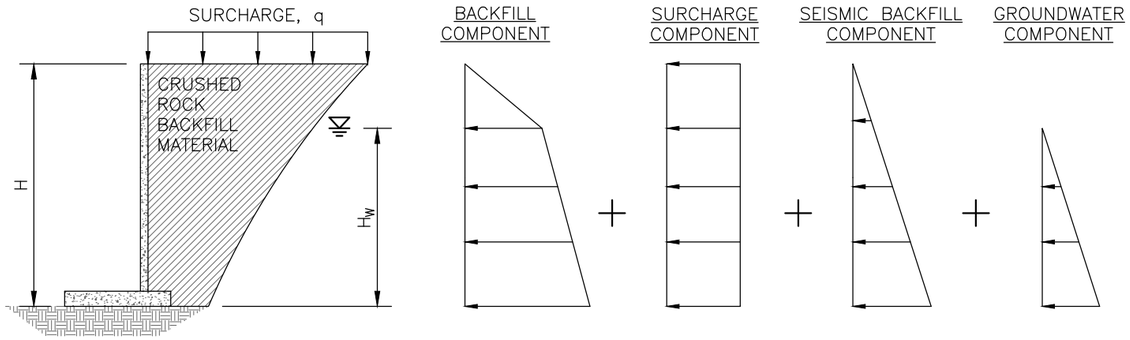
GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
INFLUENT PUMP STATION

FIG.3F

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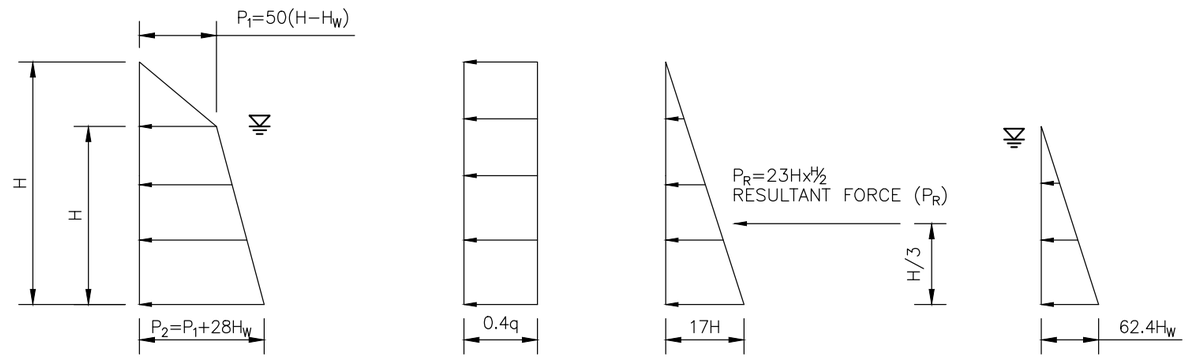
LATERAL EARTH PRESSURES ON EMBEDDED WALLS & STRUCTURES



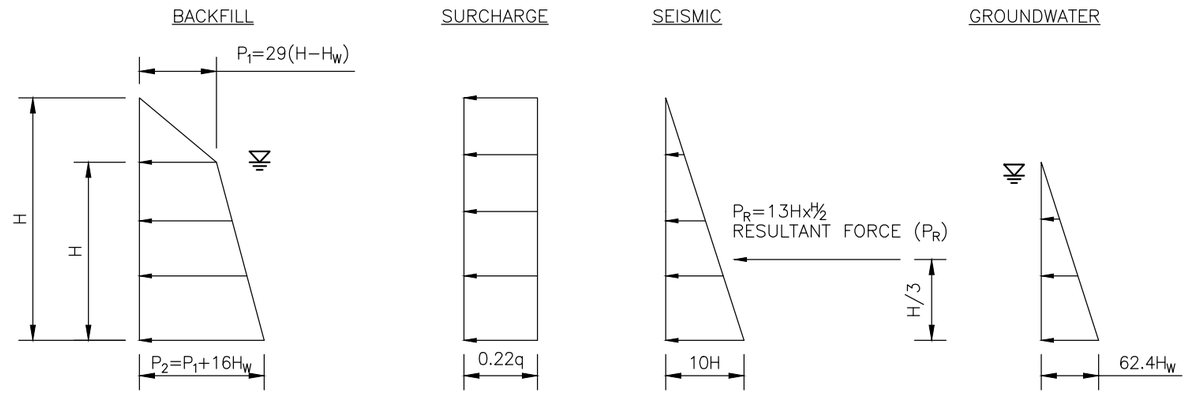
NOTES:

1. UNITS ARE POUNDS PER SQUARE FOOT (PSF).
2. BACKFILL PRESSURES BASED ON IMPORTED CRUSHED ROCK.
3. HEIGHT OF GROUNDWATER, H_W, SHOULD BE TAKEN AT GROUND SURFACE.

RESTRAINED (NON-YIELDING) EMBEDDED WALLS & STRUCTURES



NON-RESTRAINED (YIELDING) BASEMENT WALLS



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CITY OF SWEET HOME

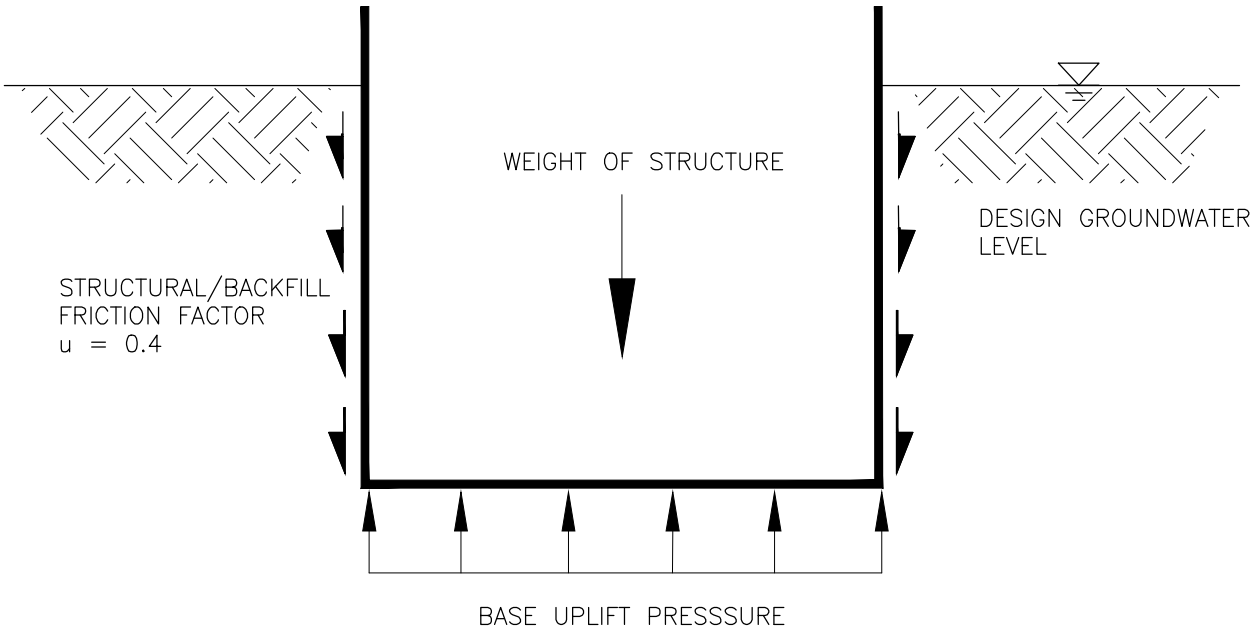
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
LATERAL EARTH PRESSURES FOR EMBEDDED WALLS

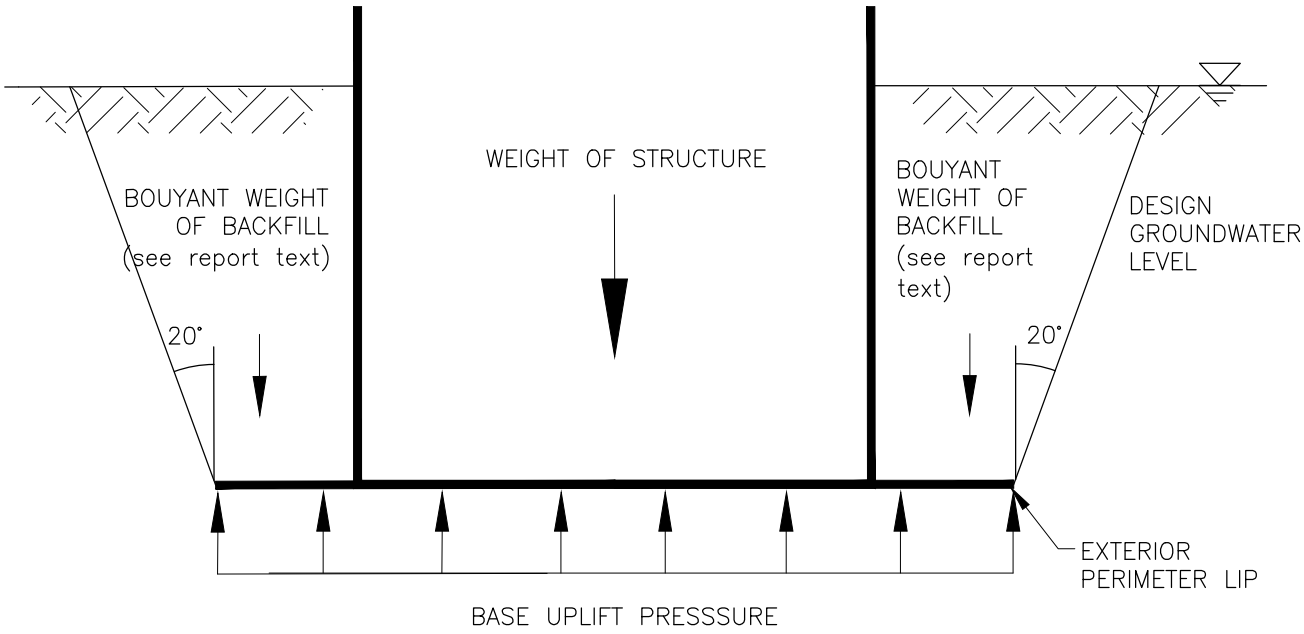
FIG.4

DEC 2022

Path: C:\Users\cburke\Box\Jobs\6367.0 Sweet Home WWTP Final Design Review\900 Design Technology\970_Xrefs\Fig4 - Lateral Earth Pressures.dwg Plot date: Jul 22, 2022, CAD User: cburke



STRUCTURE WITHOUT EXTERIOR PERIMETER LIP



STRUCTURE WITH EXTERIOR PERIMETER LIP

HYDROSTATIC UPLIFT PRESSURE AND RESISTANT FORCES

SCALE: NTS

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

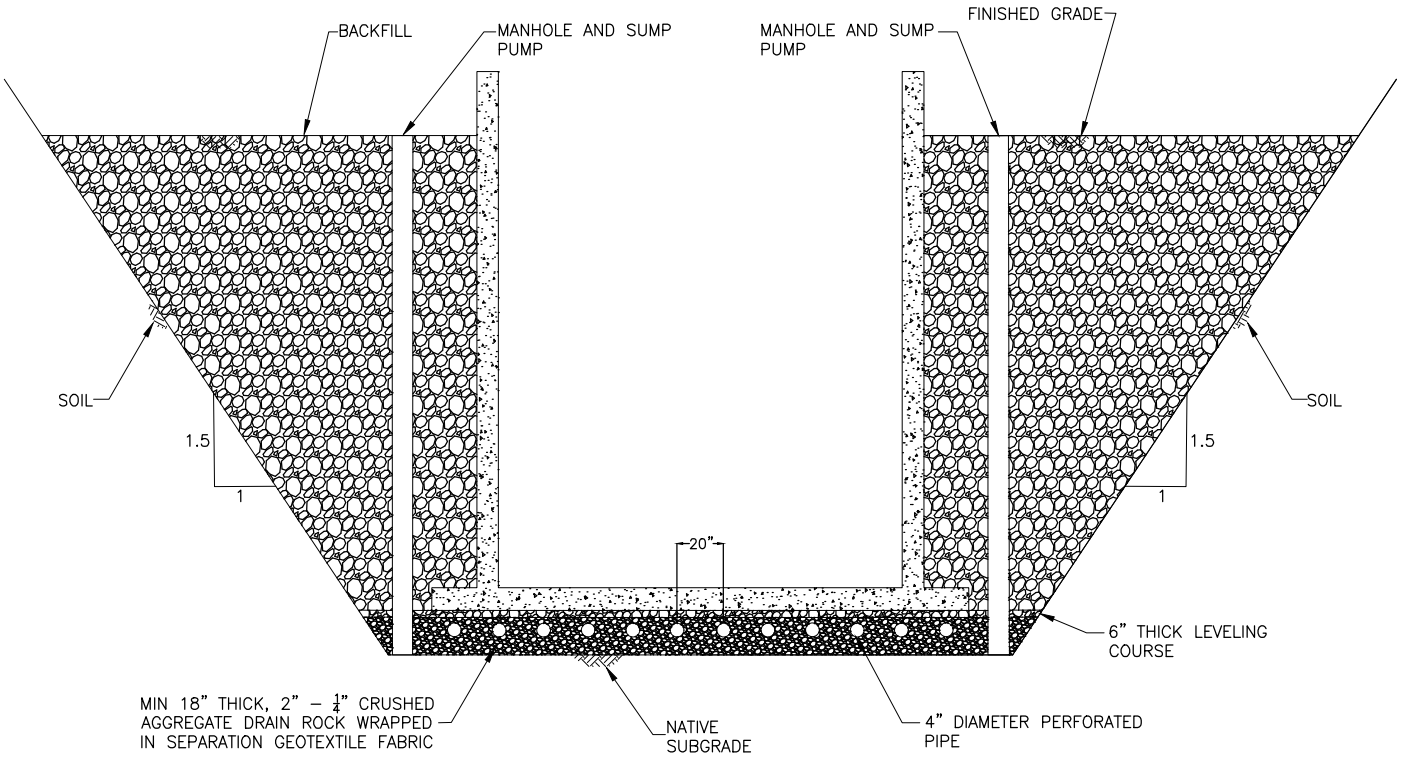
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
LATERAL EARTH PRESSURE DIAGRAM
HYDROSTATIC UPLIFT PRESSURE AND RESISTING FORCES

FIG.5

DEC 2022

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UNDERDRAIN SYSTEM
SCALE: NTS

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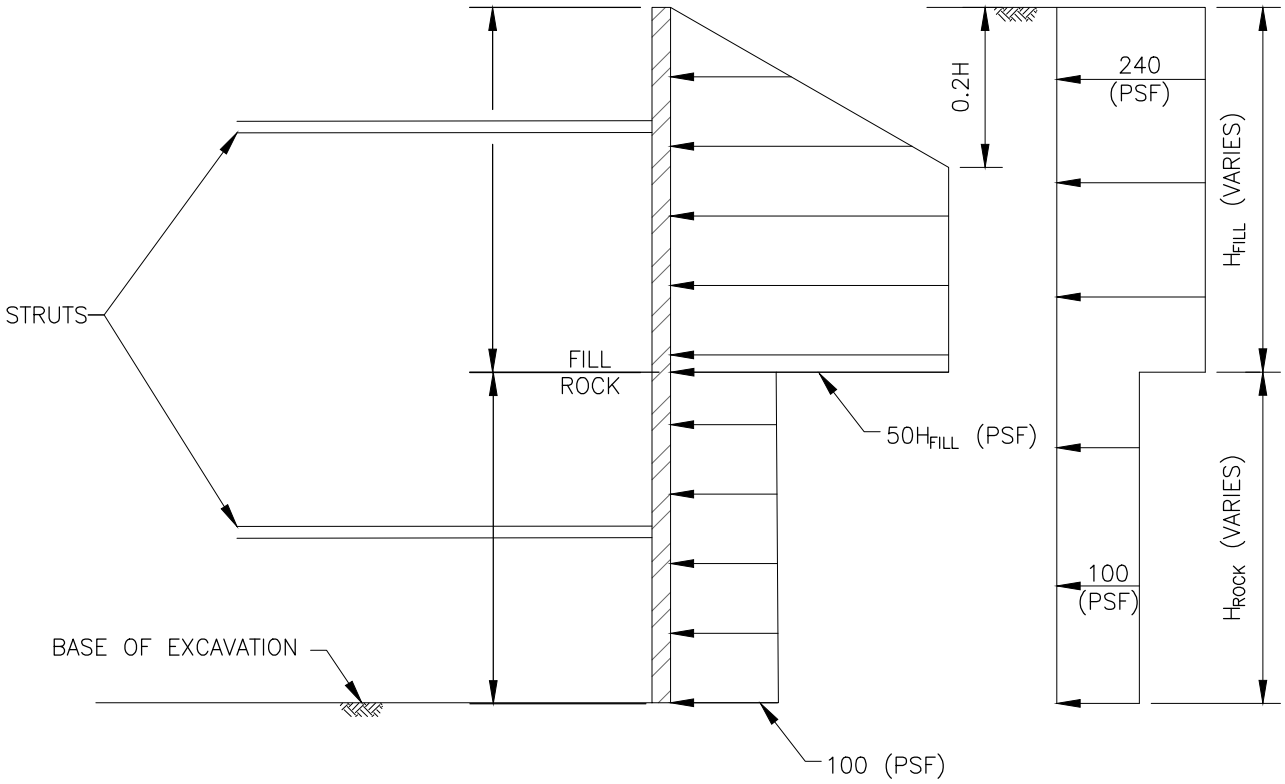
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GEOTECHNICAL ENGINEERING REPORT
CONCEPTUAL UNDERDRAIN SYSTEM

FIG.6

DEC 2022

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APPARENT LATERAL EARTH PRESSURE DIAGRAM – TEMPORARY SHORING
SCALE: NTS

NOTES:

1. EARTH PRESSURE DIAGRAM ASSUMES BRACED EXCAVATION SUPPORT.
2. SURCHARGE LOAD MAY VARY BASED ON CONTRACTOR EQUIPMENT LOADS.
3. EARTH PRESSURE DIAGRAM ASSUMES LEVEL GROUND BEHIND SHORING.
4. EARTH PRESSURE DIAGRAM DOES NOT CONSIDER GROUNDWATER – GROUNDWATER PRESSURE SHOULD BE ADDED IF GROUNDWATER IS PRESENT.

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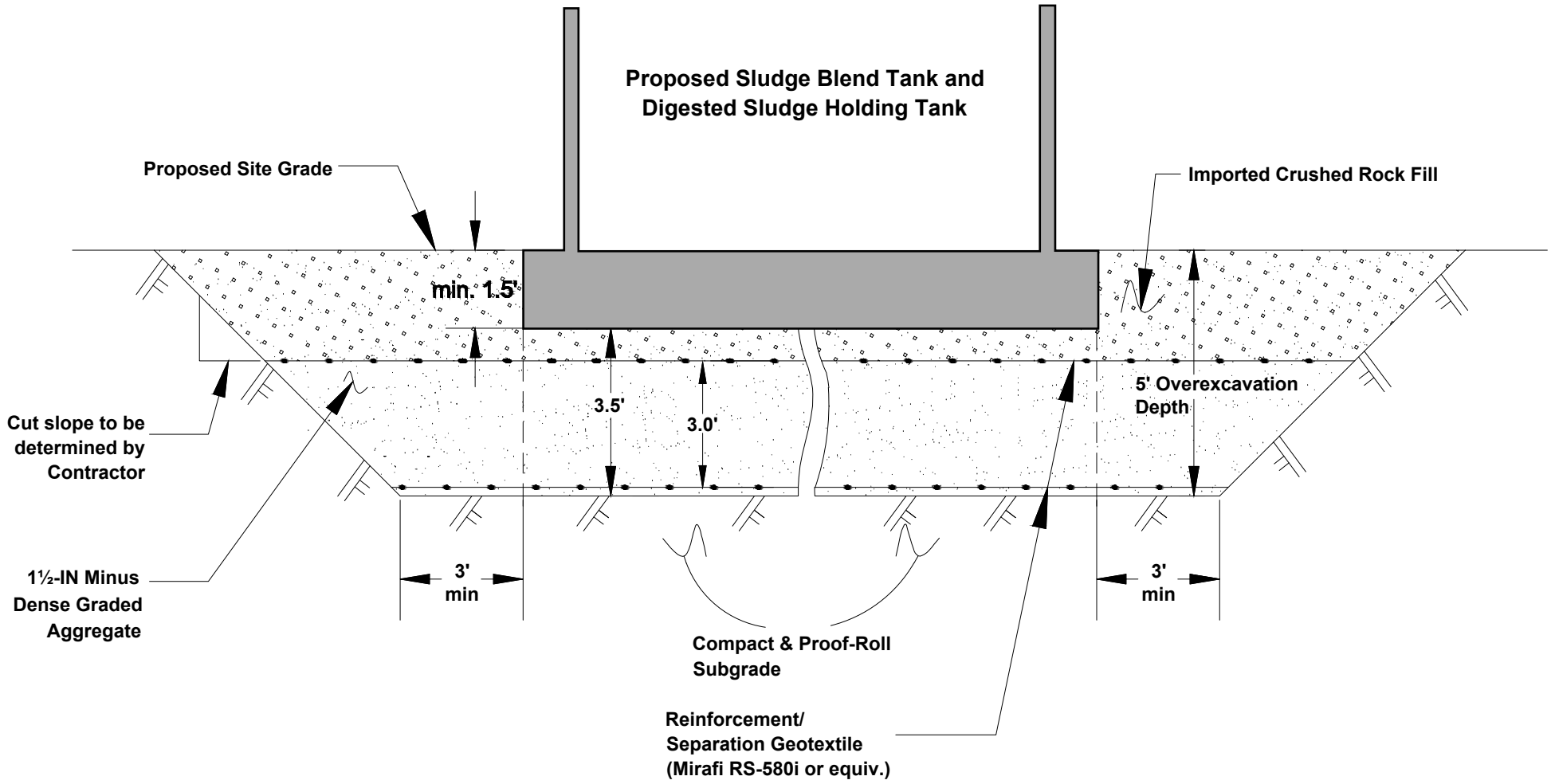
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
LATERAL EARTH PRESSURE DIAGRAM
TEMPORARY SHORING

FIG.7

DEC 2022

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NOTES

1. Upon reaching bottom of 5-foot overexcavation, compact exposed subgrade surface with heavy roller compactor or excavator-mounted hoe pack.
2. Subgrade stabilization material should be placed in 12-inch loose lifts.

NOT TO SCALE

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CITY OF SWEET HOME
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
CRUSHED ROCK MAT SECTION

FIG.8

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Appendix A

Boring Logs

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Key to Log of Borings and Descriptive Terms for Soils
Project: 5834.0 Sweet Home WWTP Schematic Design
Sweet Home, OR

Soil Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS Based on ASTM D2488 & D2487)					
MAJOR DIVISIONS			GROUP/SYMBOL		TYPICAL DESCRIPTION
COARSE-GRAINED SOILS (50% or more retained on No. 200 sieve)	GRAVELS (more than 50% retained on No. 4 sieve)	CLEAN GRAVELS (less than 5% fines)	GW		WELL-GRADED GRAVEL
			GP		POORLY GRADED GRAVEL
		GRAVELS (with 5 to 12% fines)	GW-GM		WELL-GRADED GRAVEL WITH SILT
			GW-GC		WELL-GRADED GRAVEL WITH CLAY
			GP-GM		POORLY GRADED GRAVEL WITH SILT
			GP-GC		POORLY GRADED GRAVEL WITH CLAY
		GRAVELS WITH FINES (more than 12% fines)	GM		SILTY GRAVEL
			GC		CLAYEY GRAVEL
	SANDS (less than 50% retained on No. 4 sieve)	CLEAN SANDS (less than 5% fines)	SW		WELL-GRADED SAND
			SP		POORLY GRADED SAND
		SANDS (with 5 to 12% fines)	SW-SM		WELL-GRADED SAND WITH SILT
			SW-SC		WELL-GRADED SAND WITH CLAY
			SP-SM		POORLY GRADED SAND WITH SILT
			SP-SC		POORLY GRADED SAND WITH CLAY
		SANDS WITH FINES (more than 12% fines)	SM		SILTY SAND
			SC		CLAYEY SAND
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS & CLAYS (liquid limit less than 50)	INORGANIC	ML		SILT
			CL		LEAN CLAY
		ORGANIC	OL		LOW PLASTICITY ORGANIC CLAY
	SILTS & CLAYS (liquid limit greater than 50)	INORGANIC	MH		ELASTIC SILT
			CH		FAT CLAY
		ORGANIC	OH		HIGH PLASTICITY ORGANIC CLAY
	SILT/CLAY (liquid limit between 12 and 25)	INORGANIC	CL-ML		CLAYEY SILT / SILTY CLAY
HIGHLY ORGANIC SOILS	PRIMARILY ORGANIC MATTER		PT		PEAT

Notes:

1. Dual symbols (symbols separated by a hyphen, e.g. SP-SM, slightly silty fine SAND) are used for soils between 5% and 12% fines or when liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

Moisture Content

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water, usually from below water table.

Gradation

Gradation	Description
Well-Graded	Approximately equal amounts of all grain sizes
Poorly Graded	Predominately one size (uniformly graded) or a wide range of sizes with a missing intermediate size (gap-graded)

Grain Size

Term	Grain Size	Example
Boulder	Greater than 12" (30cm)	Basketball or Larger
Cobble	3" - 12" (75mm - 30cm)	Fist to Basketball
Gravel Coarse	¾" - 3" (20mm - 75mm)	Thumb to Fist Sized
Gravel Fine	No. 4 Sieve - ¾" (5mm - 20mm)	Pea to Thumb Sized
Sand Coarse	No. 10 Sieve - No. 4 Sieve (2mm - 5mm)	Rock Salt to Pea Sized
Sand Medium	No. 40 Sieve - No. 10 Sieve (0.4mm - 2mm)	Sugar to Rock Salt
Sand Fine	No. 200 sieve - No. 40 sieve (0.08mm - 0.4mm)	Flour to Sugar
Fines	Passing No. 200 Sieve (0.08mm)	Grains Not Visible

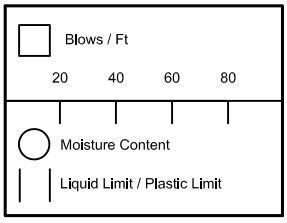
Relative Consistency

Fine - Grained Soils	
Relative Density	N, SPT Blows/Foot
Very Soft	< 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	> 30

Criteria for Describing Plasticity

Description	Criteria
Nonplastic	A ⅛" (3mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

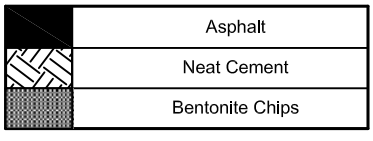
Test Symbols



Relative Density

Coarse - Grained Soils	
Relative Density	N, SPT Blows/Foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

Backfill Symbols



High/Low Water Level Screened Well Interval



McMILLEN JACOBS ASSOCIATES

Key to Boring Logs - Rock

Rock Strength

Description	Recognition	Uniaxial Compressive Strength (psf)
Extremely Weak Rock	Indented by thumbnail	30 to 150
Very Weak Rock	Peeled by pocket knife	150 to 700
Weak Rock	Peeled with difficulty by pocket knife	700 to 3,600
Moderately Strong Rock	Indented 5 mm with sharp end of pick	3,600 to 7,200
Strong Rock	One hammer blow to fracture	7,200 to 14,500
Very Strong Rock	Many hammer blows to fracture	14,500 to 36,000
Extremely Strong Rock	Only chipped by hammer blows	> 36,000

Core Recovery Calculation (%)

$$\frac{\Sigma \text{ Length of recovered core}}{\text{Total Length of core run}} \times 100$$

RQD Calculation (%)

$$\frac{\Sigma \text{ Length of core pieces} > 4 \text{ in.}}{\text{Total Length of core run}} \times 100$$

Rock Weathering

Residual Soil	Entirely decomposed to secondary minerals; material can be easily broken by hand
Completely Weathered	Almost entirely decomposed to secondary minerals; material can be granulated by hand
Highly Weathered	More than half of the rock is decomposed
Moderately Weathered	Rock is discolored and noticeably weakened, but less than half is decomposed
Slightly Weathered	Rock is slightly discolored, but not noticeably lower in strength than fresh rock
Fresh	Rock shows no discoloration, loss of strength, or other effect of weathering or alteration

Discontinuity Type

J	Joint
FJ	Joint along foliation
S	Shear
F	Fault
HJ	Healed joint
MB	Mechanical break
B	Joint along bedding

Rock Fracture Spacing

Extremely Close Spacing	Fractures spaced less than 1 inch apart
Very Close Spacing	Fractures spaced 1 to 2.5 inches apart
Close Spacing	Fractures spaced 2.5 to 8 inches apart
Moderate Spacing	Fractures spaced 8 inches to 2 feet apart
Wide Spacing	Fractures spaced 2 to 6.5 feet apart
Very Wide Spacing	Fractures spaced 6.5 to 20 feet apart
Extremely Wide Spacing	Fractures spaced greater than 20 feet apart

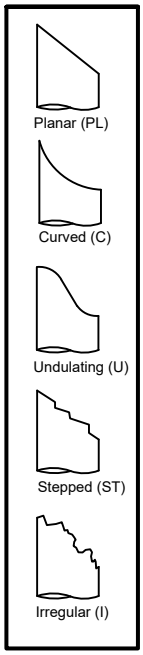
Sample Symbols

	HQ3 Rock Coring

Lithology Graphics

Basalt  Core Loss/ No Recovery 

Fracture Shape



Surface Roughness

Slickensided	Surface has smooth, glassy finish with visual evidence of striations
Smooth	Surface appears smooth and feels so to the touch
Slightly Rough	Asperities on discontinuity surfaces are distinguishable and can be felt
Rough	Ridges and side-angle steps are evident, surface feels very abrasive
Very Rough	Near vertical steps and ridges occur on discontinuity surface

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-1

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary and HQ Wireline/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **13.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **516.5 ft**	
Location: **Survey**	Coordinates: **7617396.39 E, 275319.73 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete - 18" thick (Pavement)		
							GM	Dense, moist, gray Silty Gravel (GM); Fine to coarse angular gravel, low plasticity silt (Base Aggregate)		At 2.5 feet very slow, very rough drilling. At 3.5 feet switch to rock coring.
512 / 5		100	RUN 1					BASALT, very strong (R5), slightly weathered to fresh, moderately to highly fractured, planar, stepped, smooth to rough joints with very narrow apertures (Little Butte Volcanic Series - Tholeiitic Basalt) *Run 1: 3.5-8.5 feet.* *RQD = 59%*		From 5.20 feet to 6.30 feet, UCS = 25,300 psi.
507 / 10		80	RUN 2					*Run 2: 8.5 -13.5 feet:* *RQD = 42%* *Planar and irregular, smooth to slightly rough joints.*		
502 / 15										Borehole completed at 13.5ft. below ground surface (bgs).
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring B-1

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-2

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **16.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **518.2 ft**	
Location: **Survey**	Coordinates: **7617232.28 E, 275385.44 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514							OL/ OH	Organic Soil (OL/OH); Mulch (Fill)		
5/2/2018 1▼		47	S1	7-5-11 (N=16)			CL	Very stiff, moist, brown to gray brown, Sandy LEAN CLAY with Gravel (CL); Medium plasticity, medium to low toughness, fine to coarse sand, fine angular gravel (Fill)		
5		27	S2	2-4-4 (N=8)			SM	Loose, moist to wet, brown, Silty SAND with Gravel (SM); Fine to coarse sand, fine angular gravel, medium plasticity, slow dilatancy (Fill)		
		53	S3	2-3-1 (N=4)				Very loose, wet, brown, Silty SAND (SM); Fine to medium sand, low plasticity fines, rapid dilatancy (Fill)		
509										
10		73	S4	2-0-0 (N=WOR)			SM	*At 10.0 grades to orange-brown, occurrence of trace, fine, angular gravel, and slow dilatancy.*		
		33	S5	0-0-1 (N=1)						
504										
15		100	S5	17-18-27 (N=45)			GC	Very dense, moist, gray and olive-brown, CLAYEY GRAVEL with Sand (GC); Fine to coarse angular gravel, fine to coarse sand, medium plasticity fines (Fill)		Borehole completed at 16.5ft. below ground surface (bgs).
499										
20										
494										
25										
489										
30										

McMILLEN JACOBS ASSOCIATES

Boring B-2

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-3

Date(s) Drilled: **05/02/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **12.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **529.9 ft**	
Location: **Survey**	Coordinates: **7617007.93 E, 275477.18 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 5		53	S1	3-2-1 (N=3)			CH	Soft, moist, gray with trace orange mottles, Sandy FAT CLAY (CH); High plasticity, medium toughness, fine sand, occasional organics (Fill)		
		60	S2	0-1-1 (N=2)				*At 5.0 feet grades to scattered woody organics.*		
		100	S3	1-1-1 (N=2)			SC	Very loose, moist to wet, gray, CLAYEY SAND (SC); Fine to medium sand, medium plasticity and medium toughness fines, occasional 1-inch sandy lenses of slow dilatancy (Fill)		
520 / 10		87	S4	0-16-49 (N=65)			SM	Medium dense, wet, red-brown, SILTY SAND (SM); Fine to medium sand, low plasticity fines, slow dilatancy (Fill)		
		0	S5	50/0" (Refusal)				Dark gray basalt chips in cuttings (Little Butte Volcanic Series - Tholeiitic Basalt)		At 11.0 feet very rough , very slow drilling.
515 / 15										Borehole completed at 12.5ft. below ground surface (bgs).
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring B-3

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-4

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.8 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **538.6 ft**	
Location: **Survey**	Coordinates: **7616842.35 E, 275514.57 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
534 5/2/2018 1		20	S1	7-10-7 (N=17)			SM	Medium dense, moist to wet, dark gray, SILTY SAND with Gravel (SM); Fine to medium sand, fine angular gravel, low plasticity fines, slow dilatancy, scattered organics (Fill)		
5		120	S2	28-50/3" (Refusal)			GM	Very dense, moist, gray and orange, SILTY GRAVEL with Sand (GM); Fine to coarse gravel, fine to coarse sand, medium plasticity fines (Fill)		At 4.5 feet very slow, very rough drilling.
529 10										Borehole completed at 5.8ft. below ground surface (bgs).
524 15										
519 20										
514 25										
509 30										

McMILLEN JACOBS ASSOCIATES

Boring B-4

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-5

Date(s) Drilled: **05/02/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary and HQ Wireline/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **528.8 ft**	
Location: **Survey**	Coordinates: **7617036.16 E, 275580.52 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
524 / 5		53	S1	1-5-6 (N=11)			ML	Stiff, moist, gray, Sandy SILT (ML); Low plasticity, medium toughness, fine sand, trace coarse sand, occasional organics (Fill)		
		53	S2	1-1-1 (N=2)			ML	Soft, moist to wet, green to red-brown, Sandy SILT (ML); Low plasticity, low toughness, fine to medium sand, occasional organics (Fill)		
10/29/2015 11:2016 1		73	S3	1-4-11 (N=15)			ML	Stiff, wet, gray and red-brown, Sandy SILT (ML); Low plasticity, medium toughness fines, fine sand, trace medium and coarse sand, occasional organics (Fill)		At 8.5 feet, more difficulty drilling, driller remarks likely weathered rock.
519 / 10		100	RUN 1					Run 1: 9.0 - 13.0 feet, RQD = 75%; BASALT, very strong (R5), slightly weathered to fresh, moderately to highly fractured, planar and curved, smooth to rough, high angle and sub-horizontal narrow joints (Little Butte Volcanic Series - Tholeiitic Basalt)		At 9.0 feet, switch to rock coring. RQD = 75%. From 11.7 feet to 12.4 feet UCS = 29,919 psi.
								Run 2: 13.0-18.0 feet, RQD = 86%, addition of irregular joints and < 0.1" thick light blue green staining/coating of occasional joints.		At 13.0 feet RQD = 86%.
514 / 15		100	RUN 2							
								Run 3: 18.0-23.0 feet, RQD = 74%, grade to medium strong based on testing		At 18.0 feet RQD = 74%. From 18.0 feet to 19.0 feet UCS = 6,932 psi.
509 / 20		100	RUN 3							
504 / 25										Borehole completed at 23ft. below ground surface (bgs).
499 / 30										

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Boring B-5

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-01

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **517.3 ft**	
Location: **Survey**	Coordinates: **7617295.47 E, 275346.48 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Dense, gray, Silty GRAVEL (GM); (Base Aggregate)		
513 / 5			S1				CL	Very soft to soft, moist, brown, LEAN CLAY with Sand (CL); Low plasticity, medium toughness, fine sand, trace medium sand, occasional organics (Fill)		At 9.0 feet driller remarks that the material stiffens.
508 / 10							GC	Very loose to loose, moist to wet, gray brown, CLAYEY GRAVEL with Sand (GC); Fine to coarse angular basalt gravel, fine to coarse sand, low plasticity fines (Fill)		At 10.0 feet, driller remarks that the material feels like rock but the auger is able to continue to spin. Auger refusal at 11 feet.
503 / 15										Borehole completed at 11ft. below ground surface (bgs).
498 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
493 / 25										
488 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-01

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-02

Date(s) Drilled: **05/01/2018 - 01/05/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **526.1 ft**	
Location: **Survey**	Coordinates: **7617102.54 E, 275424.97 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
522 / 5							CL	Soft to very soft, moist, brown to light brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine angular gravel, occasional organics (Fill)		At 2.5 feet very slow, very rough drilling.
517 / 10										Auger refusal at 11.5 feet.
512 / 15										Borehole completed at 11.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
507 / 20										
502 / 25										
497 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-02

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-03

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **16.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.4 ft**	
Location: **Survey**	Coordinates: **7617036.27 E, 275432.54 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 / 0							GM	Asphalt (Pavement) Base rock (Fill) Very soft to soft, moist, dark gray-brown, LEAN CLAY with Sand (CL); Fine sand (Fill)		
5							CL			
4/30/2018 ▼										
521 / 10							CL	Very soft to soft, moist to wet, gray, Sandy LEAN CLAY (CL); Medium plasticity, fine to medium sand (Fill) *At 13.0 feet, grades to brown, moist to wet, decrease in sand content.*		
516 / 15										Auger refusal at 16 feet.
										Borehole completed at 16ft. below ground surface (bgs).
511 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
506 / 25										
501 / 30										

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Boring P-03

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-04

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **7.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.8 ft**	
Location: **Survey**	Coordinates: **7616984.89 E, 275442.28 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
							GM	Dense, moist, gray Silty GRAVEL (GM); Fine to coarse angular gravel, low plasticity silt, 5 inches thick (Base Aggregate)		
							CL			
			S1				OL/ OH	Very soft to soft, moist, dark gray-brown, LEAN CLAY (CL); (Fill)		At 2.5 feet driller remarks that material becomes stiffer, woody material began smoking so driller added water to hole, very slow drilling. Organic chemical odor in the wood fiber of Sample 1.
526								Hard, moist, brown, Organic Soil with Sand (OL/OH); Frequent hard wood in clay (Fill)		
5								Very soft to soft, moist, green-brown with brown-orange mottles, LEAN CLAY (CL); Low plasticity, fine sand, trace medium sand (Fill)		
			S2				CL			Auger refusal at 7.5 feet.
521										Borehole completed at 7.5ft. below ground surface (bgs).
10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
516										
15										
511										
20										
506										
25										
501										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-04

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-05

Date(s) Drilled: **05/01/2018 - 05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **3.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **533.1 ft**	
Location: **Survey**	Coordinates: **7616928.58 E, 275458.29 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							CL	Very soft to soft, moist, brown to light brown, LEAN CLAY with Sand (CL); Low plasticity, medium toughness, fine sand, trace coarse angular gravel, occasional organics (Fill)		Auger refusal at 3.5 feet.
529 / 5										Borehole completed at 3.5ft. below ground surface (bgs).
524 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
519 / 15										
514 / 20										
509 / 25										
504 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-05

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-06

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **3.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **536.2 ft**	
Location: **Survey**	Coordinates: **7616858.52 E, 275586.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
			S1				CL	Stiff, moist to wet, brown, LEAN CLAY (CL); Low plasticity, medium toughness, trace fine to medium sand, fine gravel, occasional woody organics (Fill)		Auger refusal at 3.5 feet.
532 / 5										Borehole completed at 3.5ft. below ground surface (bgs).
527 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
522 / 15										
517 / 20										
512 / 25										
507 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-06

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-07

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **2.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **538.0 ft**	
Location: **Survey**	Coordinates: **7616789.32 E, 275532.46 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Very loose to loose, moist, dark brown, SILTY GRAVEL with Sand (GM); Angular fine to coarse gravel with cobbles, low plasticity fines (Fill)		Auger refusal at 2.5 feet.
533 5										Borehole completed at 2.5ft. below ground surface (bgs).
528 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
523 15										
518 20										
513 25										
508 30										

McMILLEN JACOBS ASSOCIATES

Boring P-07

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-08

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **7.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **535.2 ft**	
Location: **Survey**	Coordinates: **7616905.96 E, 275577.01 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
531 / 5			S1				GM	Very loose to loose, moist, dark brown, SILTY GRAVEL with Sand (GM); Fine to coarse angular to subangular gravel, fine to coarse sand, low plasticity fines, occasional woody organics (Fill)		Slight petroleum odor while drilling. Auger refusal at 7.5 feet.
526 / 10										Borehole completed at 7.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
521 / 15										
516 / 20										
511 / 25										
506 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-08

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-09

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **4.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.5 ft**	
Location: **Survey**	Coordinates: **7616966.80 E, 275594.59 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 5/2/2018 ▼ 5			S1				CL	Moist, gray-brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel, scattered organics (Fill)		Slight petroleum odor. Auger refusal at 4 feet.
										Borehole completed at 4ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
521 10										
516 15										
511 20										
506 25										
501 30										

McMILLEN JACOBS ASSOCIATES

Boring P-09

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-10

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.1 ft**	
Location: **Survey**	Coordinates: **7616963.18 E, 275547.22 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 0							GM	Very loose to loose, moist, brown, SILTY GRAVEL with Sand (GM); Fine to coarse gravel, fine and coarse sand, low plasticity. (Fill)		
5/1/2018 1							CL	Very soft to soft, wet, gray-brown, LEAN CLAY with Sand (CL); Low plasticity, fine sand, trace angular fine angular gravel. (Fill)		Auger refusal at 5.5 feet.
521 5										Borehole completed at 5.5ft. below ground surface (bgs).
516 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
511 15										
506 20										
501 25										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-10

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-11

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **529.8 ft**	
Location: **Survey**	Coordinates: **7617007.94 E, 275561.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 5			S1				GC	Very loose to loose, moist to wet, brown to gray brown, Clayey GRAVEL with Sand (GC); Fine to coarse gravel, fine to coarse sand (Fill)		Auger refusal at 5.5 feet.
520 10										Borehole completed at 5.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
515 15										
510 20										
505 25										
500 30										

5/1/2018 1

McMILLEN JACOBS ASSOCIATES

Boring P-11

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-12

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **526.4 ft**	
Location: **Survey**	Coordinates: **7617070.84 E, 275609.56 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
522 / 5			S1				CL	Very soft to soft, moist, brown, Gravelly LEAN CLAY with Sand (CL); Low plasticity, fine to coarse angular gravel, fine to coarse sand (Fill)		Auger refusal at 5 feet.
517 / 10										Borehole completed at 5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
512 / 15										
507 / 20										
502 / 25										
497 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-12

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-13

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **8.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **523.6 ft**	
Location: **Survey**	Coordinates: **7617121.16 E, 275620.34 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
519 / 0							CL	Very soft to soft, moist to wet, dark brown to gray brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel (Fill)		Loose gravelly material begins caving at the ground surface.
5/6/2018 1										Auger refusal at 8.5 feet.
514 / 5										Borehole completed at 8.5ft. below ground surface (bgs).
509 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
504 / 15										
499 / 20										
494 / 25										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-13

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-14

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **521.7 ft**	
Location: **Survey**	Coordinates: **7617149.97 E, 275571.01 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
517 / 5			S1				CL	Very soft to soft, wet, gray-brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel (Fill)		Observed groundwater at approximately 4.0 feet water present, difficult to measure due to gravel.
512 / 10										Auger refusal at 5.5 feet.
507 / 15										Borehole completed at 5.5ft. below ground surface (bgs).
502 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
497 / 25										
492 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-14

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-15

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **2.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **519.1 ft**	
Location: **Survey**	Coordinates: **7617194.34 E, 275628.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
519 0							GC	Very loose to loose, moist to wet, brown, CLAYEY GRAVEL with Sand (GC); Fine angular gravel, fine to coarse sand (Fill)		Auger refusal at 2.5 feet.
4/30/2018 ▽										Borehole completed at 2.5ft. below ground surface (bgs).
515 5										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
510 10										
505 15										
500 20										
495 25										
490 30										

McMILLEN JACOBS ASSOCIATES

Boring P-15

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-16

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **26.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **517.1 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617309.79 E, 275352.81 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
513 / 5								Asphalt (Pavement) Soft, moist, brown, CLAY (CL) (Fill)		
							CL			
508 / 10										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
503 / 15										
498 / 20										
493 / 25										
										Borehole completed at 26ft. below ground surface (bgs).
488 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-16

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-17

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **11.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **516.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617358.56 E, 275414.92 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
								Soft, moist, brown, CLAY (CL) (Fill)		
							CL			
512 5										
								Basalt, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
507 10										
										Borehole completed at 11ft. below ground surface (bgs).
502 15										
497 20										
492 25										
487 30										

McMILLEN JACOBS ASSOCIATES

Boring P-17

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-18

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.5 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617209.77 E, 275451.86 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514 / 5							CL	Soft, moist, brown, CLAY (CL) (Fill)		
509 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
504 / 15										Borehole completed at 15ft. below ground surface (bgs).
499 / 20										
494 / 25										
489 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-18

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-19

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.0 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617228.61 E, 275499.48 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
								Soft, moist, brown, CLAY (CL) (Fill)		
514							CL			
5										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
509										
10										
504										
15										
499										
20										Borehole completed at 20ft. below ground surface (bgs).
494										
25										
489										
30										

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-20

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **525.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617111.38 E, 275430.15 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
521 / 5							CL	Soft, moist, brown, CLAY (CL) (Fill)		
516 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
511 / 15										
506 / 20										Borehole completed at 20ft. below ground surface (bgs).
501 / 25										
496 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-20

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-21

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **521.8 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617111.78 E, 275548.31 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
517 / 5							GM	Loose, gray, silty GRAVEL (GM) (Fill)		
512 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
507 / 15										
502 / 20										
497 / 25										Borehole completed at 23ft. below ground surface (bgs).
492 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-21

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-22

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.5 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617179.82 E, 275578.51 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514 / 5							CL	Soft, moist, brown, slightly sandy CLAY (CL) (Fill)		
509 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
504 / 15										
499 / 20										Borehole completed at 20ft. below ground surface (bgs).
494 / 25										
489 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-22

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-23

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **530.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617036.68 E, 275432.95 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, slightly silty GRAVEL (GM) (Fill)		
								Soft, moist, brown, CLAY (CL) (Fill)		
526 / 5							CL			
521 / 10										
516 / 15								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
511 / 20										There was no return of rock chips until 22 feet bgs. Driller commented that the hole was being plugged by dirt and preventing return of rock fragments.
506 / 25										Borehole completed at 23ft. below ground surface (bgs).
501 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-23

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-24

Date(s) Drilled: **10/30/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **529.7 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617008.03 E, 275578.53 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 0							GM	Loose, gray, silty GRAVEL (GM) (Fill)		
525 / 5								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		Driller commented that it got wet around 5 feet bgs.
520 / 10										
515 / 15										Borehole completed at 15ft. below ground surface (bgs).
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-24

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-25

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **506.4 ft**	
Location: **Pleasant Valley Boat Ramp**	Coordinates: **7617287.27 E, 275672.91 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
502								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
5										
497										
10										
492										
15										Borehole completed at 15ft. below ground surface (bgs).
487										
20										
482										
25										
477										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-25

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-26

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **507.2 ft**	
Location: **Pleasant Valley Boat Ramp**	Coordinates: **7617279.85 E, 275716.52 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
503 5								BASALT, fractured, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		Driller comments that between 5 and 12 feet bgs seemed like highly fractured rock.
498 10										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
493 15										
488 20										
483 25										Borehole completed at 23ft. below ground surface (bgs).
478 30										

McMILLEN JACOBS ASSOCIATES

Boring P-26

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-27

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **26.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **516.6 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617372.72 E, 275312.04 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete (Pavement)		
								Soft, moist, brown, slightly sandy CLAY (CL) (Fill)		
512 / 5							CL			
507 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
502 / 15										
497 / 20										
492 / 25										
487 / 30										Borehole completed at 26ft. below ground surface (bgs).

McMILLEN JACOBS ASSOCIATES

Boring P-27

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-28

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 11.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 516.5 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617342.00 E, 275383.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
512 / 5		67	SPT-1	1-1-1 (N=2)			ML	Soft, moist, brown, SILT (ML); low plasticity, trace fine gravel, trace fine sand, trace wood fibers. (Fill)		
		100	G-1					*Becomes gray mottled at 5.5 feet.*		
507 / 10		64	SPT-2	1-7-50/3" (Refusal)				*10 - 11 feet: sample consists of approx. 50% wood fibers by volume.* *Auger refusal at 11.25 feet on basalt bedrock.*		Borehole completed at 11.25ft. below ground surface (bgs).
502 / 15										
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-28

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-29

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 19.0 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 517.3 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617301.00 E, 275320.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
								Base Aggregate - 3" thick (Fill)		
								Soft, moist, brown, SILT (ML); low plasticity, trace fine gravel, trace fine sand, trace wood fibers. (Fill)		
513		100	G-1							
5		20	SPT-1	1-0-2 (N=2)			ML			
		100	G-2							
508										
10		33	SPT-2	0-7-26 (N=33)				*Becomes wet at 10 feet.*		Auger grinding below 10 - 15 feet.
		100	G-3					BASALT; very weak, dark brown, highly weathered to decomposed (Little Butte Volcanic Series - Tholeiitic Basalt)		
		70	SPT-3	50/12" (Refusal)						
503										
15		98	SPT-4	26-50/5" (Refusal)				*Penetration rate decreases significantly at 15 feet; stronger rock inferred below this depth.*		Smooth, slow drilling below 15 feet.
		87	SPT-5	12-23-33 (N=56)				*Becomes dark blue-gray at 18 feet.*		
498										Borehole completed at 19ft. below ground surface (bgs).
20										
493										
25										
488										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-29

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-30

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 11.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 519.8 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617195.00 E, 275427.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
		100	G-1				ML	Moist, light brown, SILT with gravel (ML); low plasticity, fine to coarse angular gravel. (Fill)		
515 / 5		100	SPT-1	1-0-1 (N=1)			SM	Very soft, wet, light brown, Silty SAND (SM); fine to medium sand, low plasticity fines. (Fill)		
510 / 10		40	SPT-2	8-11-50/3" (Refusal)				*Basalt inferred below 11 feet.* *Auger refusal at 11.25 feet on basalt bedrock.*		Borehole completed at 11.25ft. below ground surface (bgs).
505 / 15										
500 / 20										
495 / 25										
490 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-30

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-31

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 12.7 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 520.8 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617173.00 E, 275391.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
								Base Aggregate - 1" thick (Fill)		
							ML	Moist, light brown, SILT with gravel (ML); low plasticity, fine to coarse angular gravel. (Fill)		
516 / 5		33	SPT-1	0-0-1 (N=1)			ML	Very soft, moist to wet, Sandy SILT (ML); fine to medium sand, low plasticity fines. (Fill)		
511 / 10		40	SPT-2	30-38-16 (N=54)				*Basalt inferred below 10 feet.*		Rod chatter begins at 9 feet and increases significantly below 10 feet.
		147	SPT-3	50/2" (Refusal)				*Auger refusal at 12.67 feet on basalt bedrock.*		Borehole completed at 12.67ft. below ground surface (bgs).
506 / 15										
501 / 20										
496 / 25										
491 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-31

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-32

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 10.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 530.4 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617027.00 E, 275515.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 6" thick (Pavement)		
								Base Aggregate - 2" thick (Fill)		
		100	G-1				ML	Moist, dark brown, SILT with gravel (ML); low plasticity, fine to coarse gravel. (Fill)		
526										
5		100	SPT-1	0-1-1 (N=2)			ML	Soft, moist, gray, SILT (ML); low plasticity, trace fine sand. (Fill) *Becomes gray at 4.5 feet.*		
521										Rod chatter below 9.5 feet bgs.
10		47	SPT-2	50/2" (Refusal)				*Auger refusal at 10.17 feet on basalt bedrock.*		Borehole completed at 10.17ft. below ground surface (bgs).
516										
15										
511										
20										
506										
25										
501										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-32

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-33

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 3.7 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 529.6 ft	
Location: See Figure 2 Site Plan	Coordinates: 7616945.00 E, 275701.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 5		100	G-1				GM	Moist, brown, Silty GRAVEL (GM); fine to coarse gravel, non-plastic fines. (Fill)		Strong rod chatter from ground surface to 3.5 feet bgs.
		0	SPT-1	50/2" (Refusal)				*Basalt inferred below 3.5 feet.* *Auger refusal at 3.67 feet on basalt bedrock.*		Auger bit grinding at 3.5 feet. Borehole completed at 3.67ft. below ground surface (bgs).
520 / 10										
515 / 15										
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-33

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-34

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 15.0 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 516.9 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617301.00 E, 275494.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
							GM	Base Aggregate - 2" thick (Fill)		
								Moist, brown, Silty GRAVEL (GM); fine to coarse gravel, low plasticity fines. (Fill)		
		100	G-1					Soft to very soft, moist, brown, SILT (ML); low plasticity, trace fine sand. (Fill)		
512 / 5		40	SPT-1	1-1-3 (N=4)			ML			
507 / 10		33	SPT-2	1-0-1 (N=1)				*Becomes very soft, grades to Silt with sand at 10 feet.*		
502 / 15		100	SPT-3	50/2" (Refusal)				*Auger refusal at 15 feet on basalt bedrock.*		Borehole completed at 15ft. below ground surface (bgs).
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-34

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-35

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 7.1 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 517.5 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617255.00 E, 275628.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Moist, dark gray and brown, Silty GRAVEL (GM); fine to coarse gravel. (Fill)		Rod chatter from ground surface to 5 feet bgs.
							ML	Soft, moist, brown, SILT (ML); low plasticity, trace fine sand. (Fill)		
513 5		60	SPT-1	0-1-2 (N=3)						
		0	SPT-2	50/1" (Refusal)				*Basalt inferred below 6 feet.*		Rod chatter and difficulty anvancing auger below 6 feet.
								Auger refusal at 7.08 feet on basalt bedrock.		Borehole completed at 7.08ft. below ground surface (bgs).
508 10										
503 15										
498 20										
493 25										
488 30										

McMILLEN JACOBS ASSOCIATES

Boring P-35

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-36

Date(s) Drilled: **11/22/2022**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Quinn**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **8.25" Hollow Stem Auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.6 ft**	
Hole Diameter: **8.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **516.77 ft**	
Location: **SE Corner of WWTP Site**	Coordinates: **7617443.00 E, 275286.00 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete - 6" thick (Pavement)		
								Base Aggregate - 6" thick (Fill)		
								Stiff, moist, brown with orange mottling, LEAN CLAY (CL); low to medium plasticity, trace coarse rounded gravel, trace fine sand. (Fill)		
		55	SPT-1	2-8-7 (N=15)						
-5 5								*Becomes medium stiff at 5 feet bgs.*		
		50	SPT-2	2-3-4 (N=7)			CL			
		60	SPT-3	50/5" (Refusal)				*Boulders/cobbles likely from 7.5 to 9.0 feet bgs.*		Slow, difficult drilling from 7.5 to 9 feet bgs.
								Becomes stiff at 9.0 feet bgs.		Drillers cracked auger transfer rod at approximately 8.5 feet bgs. Abandoned original boring at 8.5 feet bgs due to being off vertical alignment and moved about 4 feet west to re-drill boring.
-10 10		100	SPT-4	3-3-9 (N=12)				*Becomes gray with rootlets at 10 feet bgs.*		
								Basalt inferred below 10.75 feet bgs.		Difficult, slow drilling below 10.75 feet bgs. 30 minutes to advance from 10.75 to 11.5 feet bgs.
		800	SPT-5	50/0" (Refusal)						Borehole completed at 11.6ft. below ground surface (bgs).

McMILLEN JACOBS ASSOCIATES

Boring P-36

Appendix B

Laboratory Test Results

Northwest Testing, Inc.
A Division of Northwest Geotech, Inc.
9120 SW Pioneer Court, Suite B, Wilsonville, Oregon 97070 | ph: 503.682.1880 fax: 503.682.2753 | www.nwgeotech.com

TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Report of: Atterberg limits, moisture content, and compressive strength of rock

Sample Identification

NTI completed Atterberg limits, moisture content, and compressive strength of rock testing on samples delivered to our laboratory on May 9, 2018 by a McMillen Jacobs Associates representative. Testing was performed in accordance with the standards indicated. Our laboratory test results are summarized on the following tables and attached pages.

Laboratory Test Results

Atterberg Limits (ASTM D 4318)			
Sample ID	**Liquid Limit**	**Plastic Limit**	**Plasticity Index**
B-3 S-2 @ 5 – 6.5 ft.	51	28	23
B-5 S-1 @ 2.5 – 4 ft.	44	28	16

Moisture Content of Soil (ASTM D 2216)	
Sample ID	**Moisture Content (Percent)**
B-3 S-2 @ 5 – 6.5 ft.	44.8
B-5 S-1 @ 2.5 – 4 ft.	26.3

Copies: Addressee

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TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Laboratory Testing

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-1 R-1 @ 5.2 – 6.3 ft.	2.41	4.88	100	25,302



Photo1: As received sample



Photo 2: Test sample before testing



Photo 3: Test sample after testing

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TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Laboratory Testing

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-5 R-1 @ 11.7 – 12.4 ft.	2.41	4.85	100	25,919



Photo1: As received sample

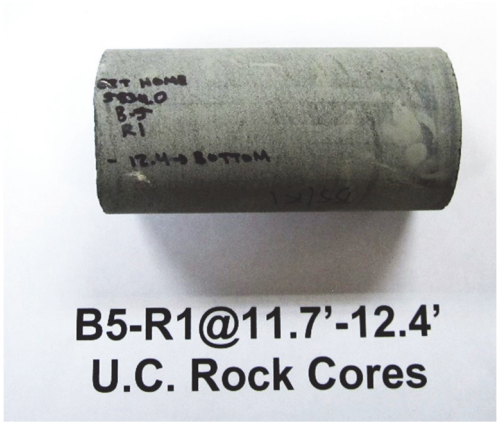


Photo 2: Test sample before testing



Photo 3: Test sample after testing

Laboratory Testing

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TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-5 R-2 @ 18 – 19 ft.	2.41	4.86	100	6932

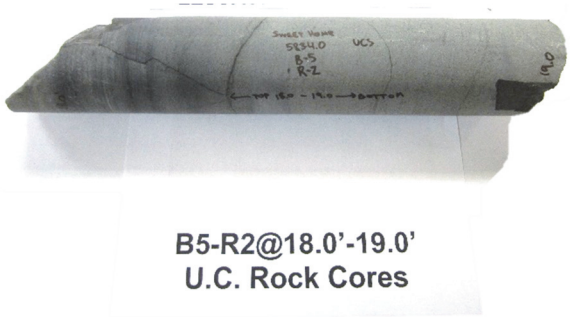


Photo1: As received sample

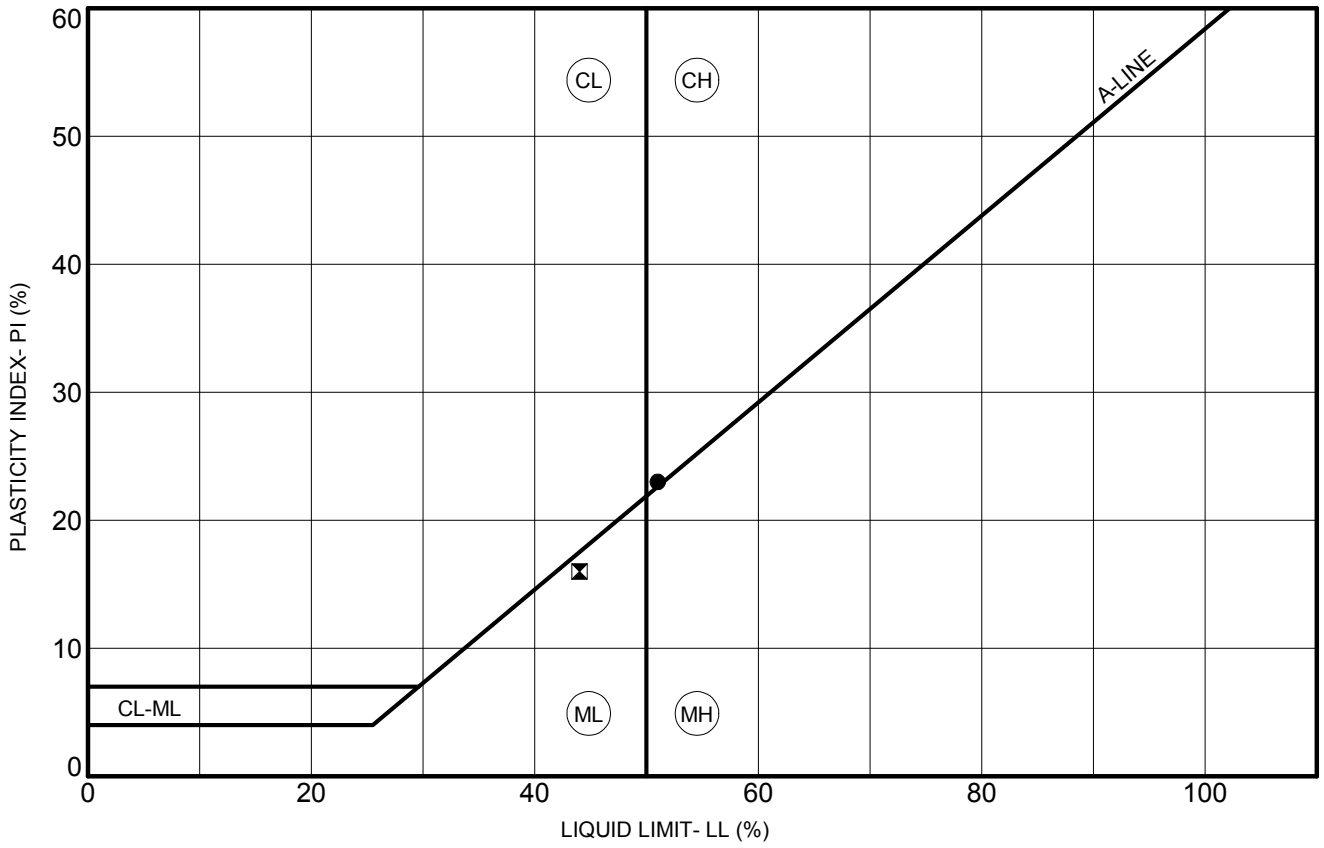


Photo 2: Test sample before testing



Photo 3: Test sample after testing

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	Sample ID	Depth (ft)	Moisture Content %	LL	PL	PI	% Pass #200	Classification
●	**B-03**	**5.0**	**(44.8)**	**51**	**28**	**23**		**CH**
⧓	**B-05**	**2.5**	**(26.3)**	**44**	**28**	**16**		**ML**

McMILLEN JACOBS ASSOCIATES

1500 SW 1ST AVE STE 750
PORTLAND, OR 97201
TELEPHONE: 503.384.2906

ATTERBERG LIMITS

Project: Waste Water Treatment Plant - Schematic Design
Number: 5834.0
Sample Location: Sweet Home
Testing Agency: Northwest Testing, Inc.

JA_ATTERBERG_PORTLAND OFFICE ADDRESS_5834.0 SWEET HOME.GPJ_JACOBS DATA TEMPLATE_GENERAL SOIL PROJECTS.GDT 6/11/18 REV-

Point Load Strength Index Test Results ASTM D-5731

PROJECT:	Sweet Home WWTP	**LAB SAMPLE NO.:**	
PROJECT NO.:	5834.0	**SAMPLE NO.:**	5834.0 - B-5
PROJECT LOCATION:	Sweet Home, OR	**SAMPLE DESCRIP:**	Basalt
SAMPLED BY:	Julia Irizarry	**DATE REPORTED:**	5/11/2018
DATE SAMPLED:	5/2/2018	**REPORTED BY:**	Devin Roth

Sample No.	Test Number	Test Type*	Rock Type	Width, W	Depth or Diameter, D	Failure Load, P	De^2	Point Load Strength Index, $I_{s(50)}$	Uniaxial Compressive Strength, UCS
				(in)	(in)	(lbs)	(in^2)	(psi)	(psi)
1	1	d	Basalt	5.31	2.36	5959	10313	513	12563
2	2	d	Basalt	5.91	2.36	3828	11459	304	7437
2B	3	d	Basalt	3.23	2.36	5158	6264	653	13717
3	4	d	Basalt	10.04	2.36	5104	19481	268	5098
3B	5	d	Basalt	5.59	2.36	6882	10848	569	13951
5	6	d	Basalt	6.69	2.36	8044	12987	579	13315
6	7	d	Basalt	5.12	2.36	4598	9931	407	9778
7	8	d	Basalt	4.13	2.36	6830	8021	714	17138
8	9	d	Basalt	11.42	2.36	8044	22154	383	9185
9	10	d	Basalt	5.20	2.36	7882	10084	690	14493
							Min	**268**	**5098**
							Max	**714**	**17138**
							Avg	**508**	**11667**

Size Corrected Point Load Index, $Is_{(50)}$

$I_{s(50)}$ = **508 psi** or **73,159 psf** or **3.5 MPa**

Mean Uniaxial Compressive Strength, σ_c

σ_c = **11,667 psi** or **1,680,111 psf** or **80 MPa**

*Test Type

d = diametral
a = axial
b = block
l= lump

Appendix C

Rock Core Photos



BOREHOLE B-01, 3.5 TO 13.5 FEET



BOREHOLE B-05, 9.0 TO 16.3 FEET

McMILLEN JACOBS ASSOCIATES	**SWEET HOME WWTP SCHEMATIC DESIGN GEOTECHNICAL DATA REPORT**	**JULY 2022**
	CORE PHOTOGRAPHS	**FIGURE C - 1**



BOREHOLE B-05, 16.3 TO 23 FEET

Appendix D

RMR Calculation

The Rock Mass Rating System

Geomechanics Classification of Rock Masses

After Z.T. Bieniawski, 1989

McMILLEN JACOBS ASSOCIATES

1500 SW First Avenue, Suite 750, Portland, OR

Project: **Sweet Home WWTP**
Date: **5/16/2018**
Location:
Boring: **B-1 &B-5**
Geologist/Engineer: **Farid Sariosseiri**
Rock Type: **Bedded Volcaniclastics**
Elevation, ft:

Rock Mass Property Input

Strength of Intact Rock, Mpa	**135**
Point Load ?	**N**
Uniaxial Compressive ?	**Y**
Bieniawski Rating	**12**
RQD, %	**67**
Bieniawski Rating	13
Discontinuity Spacing, mm	**150**
Bieniawski Rating	**7**

Conditions of Discontinuitites	**Rating**
1. Very rough surfaces, not continuous, no separation, and unweathered rock walls.	**30**
2. Slightly rough surfaces, separation < 1 mm, and slightly weathered walls.	**25**
3. Slightly rough surface, separation < 1 mm, and highly weathered walls.	**20**
4. Slickenslided surfaces -or- gouge (infilling), 1-5 mm thick -or- separation 1-5 mm and continuous.	**10**
5. Soft gouge > 5 mm -or- separation > 5 mm and continuous	**0**
Bieniawski Rating?	**25**

Groundwater Conditions	**Rating**
Conditions include:	
A. Inflow per 10 m of tunnel length (L/m),	
B. Ratio of joint water pressure to σ_1,	
C. General conditions.	
1. No inflow -or- 0 ratio -or- completely dry.	**15**
2. < 10 L/min -or- < 10 ratio -or- damp.	**10**
3. 10-25 L/min inflow -or- 0.1-0.2 ratio -or- wet.	**7**
4. 22-125 L/min inflow -or- 0.2-0.5 ratio -or- dripping.	**4**
5. > 125 L/min inflow -or- > 0.5 ratio -or- flowing.	**0**
Bieniawski Rating?	**15**

Orientation of Discontinuities	**Rating**		
	Tunnels	Foundations	Slopes
Very Favorable	**0**	**0**	**0**
Favorable	**-2**	**-2**	**-5**
Fair	**-5**	**-7**	**-25**
Unfavorable	**-10**	**-15**	**-50**
Very Unfavorable	**-12**	**-25**	**-60**
Bieniawski Rating?			**-5**

Overall RMR	**67**	
Class	**II**	**Good Rock**

GSI **62**

Exhibit E

Design-Builder's Warranty Guarantee

BAKER SILO LLC.
concrete water reservoirs & storage tanks

February 6, 2023

To: City of Sweet Home

Subject: Sludge Blend Tank Design-Build Reservoir Warranty

Dear Client:

We, the undersigned, do hereby warrant for a period of 5 years from the date of Final Completion of all work performed under the terms of the contract documents.

Final Completion date is xx, xx, xxxx

Baker Silo, LLC. will remedy at our expense any defects appearing during that period due to poor materials and/or workmanship, free of charge upon written notification.

If we can be of further assistance, please give me a call. Thank you for this opportunity.

Sincerely,

Norm Heerspink
Managing Member

P.O. Box 979 Lynden, WA 98264 | www.BAKERSILO.com | P. 360-354-4940 | F. 360-354-5657 | E. info@bakersilo.com

Mahler Water Reclamation Facility (MWRF) Interim Improvements

ADDENDUM NO. 1

FOR

SLUDGE BLEND TANK DESIGN-BUILD

To: All Prospective Bidders

The following clarifications, changes, additions and/or deletions are hereby made a part of the Contract Documents issued for the above referenced project as fully and completely as if the same were fully set forth therein.

This Addendum consists of 276 pages, including this cover page.

CHANGES

1. **The Contract Documents Shall be replaced in their entirety with the attached updated Contract Documents.**

End of Addendum No. 1

Mr. Greg Springman, Public Works Director

December 20, 2022
Date

City of Sweet Home
1400 24th Avenue
Sweet Home, OR 97386

Mahler Water Reclamation Facility (MWRF) Interim Improvements

Sludge Blend Tank Design-Build

December 2022

WEST YOST
Water. Engineered.

5 Centerpointe Dr #130,
Lake Oswego, OR 97035
(530) 756-5905
FAX (530) 756-5991

MWRF Interim Improvements Project Sludge Blend Tank Design-Build
Table of Contents

BIDDING REQUIREMENTS

EJCDC C-111	Advertisement for Bids
EJCDC C-200	Instruction to Bidders
00 40 00	Bid Form
EJCDC C-430	Bid Bond (Penal Sum Form)
00 43 37	First-Tier Subcontractor Disclosure Form
00 45 19	Non-Collusion Affidavit

CONTRACT FORMS

EJCDC D-520	Agreement between Owner and Design-Builder
EJCDC D-610	Design-Build Performance Bond
EJCDC D-615	Design-Build Payment Bond

CONDITIONS OF THE CONTRACT

EJCDC D-700	Standard General Conditions of the Contract Between Owner and Design-Builder

TECHNICAL SPECIFICATIONS

Division 01 – General Requirements

01 33 00	Submittals

Division 05 – Metals

05 50 01	Anchor Bolts and Anchoring Devices
05 52 00	Handrail

Division 13 – Specialty Construction

13 21 20	Reinforced Cast-In-Place Concrete Tank

Division 31 – Earthwork

31 00 00	Earthwork
31 10 00	Site Preparation
31 23 16.26	Rock Excavation
31 23 19	Dewatering
31 50 00	Excavation Support and Protection

EXHIBIT A: Drawings

G-000	Cover Sheet, Vicinity and Location Maps
C-010	Overall Site Plan, Structure Coordinates, Staging and Access, Survey Control Points
C-020	Solids Area Detail Plan
M-250	Sludge Blend Tank and Mixing System Plan, Sections and Details
S-001	Structural Design Criteria

EXHIBIT B - Geotechnical Data Report

EXHIBIT C - Sample AIS Forms

ADVERTISEMENT FOR BIDS

CITY OF SWEET HOME, OREGON
MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD

General Notice

City of Sweet Home (Owner) is requesting Bids for the construction of the following Project:

MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD

Bids for the construction of the Project will be received at Sweet Home City Hall located at 3225 Main Street, Sweet Home, OR 97386, until **January 10, 2023 at 2:00 pm** local time. At that time the Bids received will be publicly opened and read.

The Project includes the following Work:

Improvements and modifications to the City of Sweet Home Mahler Water Reclamation Facility (Mahler WRF) includes furnishing all labor, materials, and equipment necessary for the design and construction of new Sludge Blend Tank and appurtenances. Site work includes general excavation with onsite and offsite disposal and installation of structural base rock.

Obtaining the Bidding Documents for Bidders

For Bidders, the Contract Documents may be examined at Sweet Home City Hall. Electronic copies of the Contract Documents will be provided by the Owner. Hard copies of the Contract Documents will be provided to the successful Bidder following Bid Award.

Instructions to Bidders

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders included in the Bidding Documents.

American Iron and Steel

Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project. All iron and steel products used in this project must be produced in the United States. The term "iron and steel products" means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials.

The following waivers apply to this Contract:

1. De Minimis,
2. Minor Components, and
3. Pig iron and direct reduced iron.

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This Advertisement is issued by:

Owner: **City of Sweet Home, Oregon**
By: **Greg Springman**
Title: **Public Works Director**
Date: **December 14, 2022**

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INSTRUCTIONS TO BIDDERS FOR DESIGN-BUILD CONTRACT

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ARTICLE 1—DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.04 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective Bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

2.06 *Electronic Documents*

A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of

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the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.

1. Electronic Documents that are available in native file format include:

a. Electronic Drawing files in Revit, AutoCAD MEP and AutoCAD Civil3D.

b. Digital Elevation Model (DEM) for the construction site

2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.

3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.

4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—RESERVED

ARTICLE 4— RESERVED

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of

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materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.02 *Existing Site Conditions*

A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The General Conditions identify the following regarding existing conditions at or adjacent to the Site:

a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.

b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.

c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make electronic copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. *Geotechnical Report:* The Bidding Documents contain a Geotechnical Data Report (GDR) for use by Bidders (Supplemental Information – bound separately).

a. As set forth in the General Conditions, the GDR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GDR is a Contract Document.

b. The Baseline Conditions in the GDR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GDR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.

c. Nothing in the GDR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the

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presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

A. Documents regarding existing Site conditions referred to in Paragraph 5.02.A are listed in the General Conditions 10.01(A.4). Owner will make copies of these other Site-related documents available to any Bidder on request.

B. Bidder shall consider information contained on these other site-related documents to be un-verified and shall not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.

C. The other Site-related documents are not part of the Contract Documents.

D. Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.

5.04 *Site Visit and Testing by Bidders*

A. Bidder may schedule a site visit. During the visit the Bidder must not disturb any ongoing operations at the Site.

B. Bidders visiting the Site are required to arrange their own transportation to the Site.

C. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer contact for visiting the Site: Mr. Steven Haney, Utilities Manager, (541) 818-8003.

D. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

E. On request and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

F. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

G. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

A. Site visits and work at the Site is governed Oregon OSHA requirements.

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5.06 *Other Work at the Site*

A. Reference is made to Article 8 of the General Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6— BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Design-Builder) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Owner and Engineer in writing.

7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all and registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5% percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents. Bid security must be at least 5% of the Bidder's maximum price.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder

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will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 91 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.

9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

10.03 Substitutes and "or-equal" materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.05 and 7.06 of the General Conditions after the Effective Date of the Contract. Each such request shall include Manufacturer's Certification letter to document compliance with AIS requirements of Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference, if applicable. Refer to Manufacturer's Certification Letter provided in these Contract Documents.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.01 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner the First-Tier Subcontractor Disclosure within 2 hours following the Bid Opening.

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ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

C. Bidders shall provide pricing for all "A-listed" or first-named equipment suppliers in the Bid Form.

12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 All names must be printed in ink below the signatures.

12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

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12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

A. Bidders must submit a Bid on a lump sum basis for each bid item as set forth in the Bid Form.

13.02 *Additive and Deductive Unit Price Work Bid Items*

A. Bidders must submit unit prices for bid items with additional work beyond the quantities included in the Lump Sum Bid.

1. Additive and Deductive Unit Price Work Items shall include:

a. None

B. Costs for Additive and Deductive Unit Price Work Bid Items will be considered by the Owner in the evaluation of bids based on the potential impact of increased or decreased quantities for these Bid items in the course of executing the Work.

C. Bidders shall not unbalance bids for Additive and Deductive Unit Price Work Items.

ARTICLE 14—SUBMITTAL OF BID

14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form and the First-Tier Subcontractor Disclosure Form are to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of the Bid Form.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, the name and address of Bidder, the date of opening, the applicable words "SEALED BID" or "FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM" and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED" or "FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM." A mailed Bid must be addressed to the location designated in the Advertisement.

14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

14.04 All responses submitted are the property of the City of Sweet Home, thus subject to disclosure pursuant to Oregon Public Records law, as qualified by ORS 279B.060(6) for similar contracts. Except for information marked "Proprietary", all documents received by City shall be available for public disclosure. The City will attempt to maintain the confidentiality of materials marked "Proprietary" to the extent permitted under the Oregon Public Records law. By responding to this solicitation, Bidders waive any challenge to the City's decisions in this regard.

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14.05 **Marking all, or substantially all, or your response as "Proprietary" is not permitted and may be grounds for the City considering your bid nonresponsive, at the City's sole discretion.** If your response contains proprietary information protected under this section, please provide an additional redacted copy.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

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18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. For determination of the apparent lowest responsive and responsible Bidder, Bids will be compared on the basis of the Lump Sum Price along with potential additional costs for Additive or Deductive Additional Work Bid Items determined at the Owner's discretion.

18.06 *Protests of Solicitation*

A. Bidders are directed to the protest procedures contained in OAR 137-049-260:

1. (3)(a) An Offeror may protest Specifications or Contract terms and conditions. Unless otherwise specified in the Solicitation Document, an Offeror must deliver a Written protest on those matters to the Contracting Agency not less than 10 Days prior to Closing;

2. (b) Content of Protest.

a. (A) An Offeror's Written protest shall include:

1) (i) A detailed statement of the legal and factual grounds for the protest;

2) (ii) A description of the resulting prejudice to the Offeror; and

3) (iii) A statement of the desired changes to the Contract terms and conditions, including any Specifications.

18.07 *Protests of Contract Award*

A. Bidders are directed to the protest procedures contained in OAR 137-049-450:

1. (4) Right to Protest Award.

a. (a) An adversely affected or aggrieved Offeror may submit to the Contracting Agency a Written protest of the Contracting Agency's intent to Award within seven Days after issuance of the notice of intent to Award the Contract, unless a different protest period is provided under the Solicitation Document.

b. (b) The Offeror's protest must be in Writing and must specify the grounds upon which the protest is based.

c. (c) An Offeror is adversely affected or aggrieved only if the Offeror is eligible for Award of the Contract as the Responsible Bidder submitting the lowest Responsive Bid or the Responsible Proposer submitting the best Responsive Proposal and is next in line for Award, i.e., the protesting Offeror must claim that all lower Bidders or higher-scored Proposers are ineligible for Award:

1) (A) Because their Offers were nonresponsive; or

2) (B) The Contracting Agency committed a substantial violation of a provision in the Solicitation Document or of an applicable Procurement statute or administrative rule, and the protesting Offeror was unfairly evaluated and would have, but for such substantial violation, been the Responsible Bidder

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offering the lowest Bid or the Responsible Proposer offering the highest-ranked Proposal.

d. (d) The Contracting Agency shall not consider a protest submitted after the time period established in this rule or such different period as may be provided in the Solicitation Document. A Proposer may not protest a Contracting Agency's decision not to increase the size of the Competitive Range above the size of the Competitive Range set forth in the RFP.

2. (5) Right to Protest Competitive Range.

a. (a) An adversely affected or aggrieved Bidder may submit to the Contracting Agency a Written protest of the Contracting Agency's decision to exclude the Bidder from the Competitive Range within seven Days after issuance of the notice of the Competitive Range, unless a different protest period is provided under the Solicitation Document. (See procedural requirements for the use of RFPs at OAR 137-049-0650.)

b. (b) The Bidder's protest shall be in Writing and must specify the grounds upon which the protest is based.

c. (c) A Bidder is adversely affected only if the Bidder is responsible and submitted a Responsive Bid and is eligible for inclusion in the Competitive Range, i.e., the protesting Bidder must claim it is eligible for inclusion in the Competitive Range if all ineligible higher-scoring Bidders are removed from consideration, and that those ineligible Bidders are ineligible for inclusion in the Competitive Range because:

1) (A) Their Bids were not responsive; or

2) (B) The Contracting Agency committed a substantial violation of a provision in the RFP or of an applicable Procurement statute or administrative rule, and the protesting Bidder was unfairly evaluated and would have, but for such substantial violation, been included in the Competitive Range.

ARTICLE 19—BONDS AND INSURANCE

19.01 Article 6 of the General Conditions sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.

19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful

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Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 21— PREVAILING WAGES

21.01 The Contractor shall abide by ORS 279c.800 through 279c.870 which relate to the prevailing wage rates for the building and construction trades in the state of Oregon. These prevailing wage rates are shown in the published Oregon Bureau of Labor and Industries (BOLI) documentation, which is described in these Contract Documents. Federal Davis-Bacon act requirements also apply, as executed by the United States Department of Labor (DOL). The higher of the two wages shall be paid to all workers as applicable on this project. The Contractor shall be aware of the requirements described elsewhere in these Contract Documents. Both items are referenced and described in the Oregon DEQ form "Prevailing Wage Agreement" included in these Contract Documents, which is a form that is required to be completed by the Contractor and submitted at the time of bid placement.

21.02 Bidders are advised to examine and to be thoroughly familiar with such requirements. No claim for additional compensation will be allowed that is based upon a lack of knowledge of these requirements or a failure to include adequate increases in such wages over the term of this Contract in the Bidder's bid price.

ARTICLE 22— PREVAILING WAGE RATE FORMS

22.01 Before payment is made by the Owner of any sums due under this Contract, the Owner must receive from the Contractor and each subcontractor or agent a copy of all required BOLI & DOL forms and Weekly Certified Payrolls from the Contractor and each subcontractor or agent.

22.02 Upon completion of this contract, the Owner must receive from the Contractor and each subcontractor a copy of all required BOLI and DOL forms for project closeout.

22.03 These forms and any required affidavits will be required before any funds retained are released to the Contractor. Forms may be obtained from BOLI and DOL. In some cases fees are required to accompany forms submitted. The Contractor is responsible for payment of these fees and shall make all applications directly to BOLI/DOL. These fees shall be incidental to all bid items of this Contract.

ARTICLE 23—NONDISCRIMINATION

23.01 During the performance of this contract, the Contractor shall comply with all federal and state nondiscrimination laws, including, but not limited to 42 U.S.C. 12101 et seq, the Americans with Disabilities Act (ADA).

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SECTION 00 40 00 - BID FORM

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD
CITY OF SWEET HOME, OREGON

THIS BID IS SUBMITTED TO: City of Sweet Home
Attn: Greg Springman, Public Works Director
3225 Main Street
Sweet Home, OR 97386

1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2.01 Bidder accepts all of the terms and conditions of the Advertisement for Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.

2.02 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.06 of the General Conditions on or before the **dates or within the number of calendar days indicated in the Agreement.**

2.03 Bidder agrees to complete the Work in accordance with the contract times provided in Article 3 of the Agreement.

2.04 Bidder accepts the provisions of the Agreement as to liquidated damages as stipulated in Article 23.03 of the Agreement and in the General Conditions.

3.01 Refer to the Instructions to Bidders for forms and documents that must be executed in full and submitted with the bid.

3.02 The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, and the General Conditions.

3.03 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data and documents identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

Addendum No.	**Addendum Date**

B. Bidder has become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site.

E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

I. Bidder has given OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by OWNER is acceptable to Bidder.

J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.01 Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the price described in the following bid schedule within the time of completion specified in the Agreement.

BID SCHEDULE

Bidder shall submit a Bid as set forth in the Bid form. Submission of Bids on this schedule signifies Bidder's willingness to enter into a Contract for the price offered. Bidders offering a Bid on this schedule must be capable of completing the Work within the time period stated in the Agreement. OWNER may elect to delete any bid item from the work.

1.01 LUMP SUM WORK

A. Bidder proposes and agrees to accept as full payment the following bid amount for the Mahler WRF Sludge Blend Tank Design-Build proposed within the Bidding Documents, and certifies that this amount is based upon the undersigned's own estimate of quantities and costs and includes sales, consumer, use, and other taxes, except as provided below, overhead and profit.

B. Lump Sum Bid Price: $_____

1.02 ADDITIVE AND DEDUCTIVE UNIT PRICE WORK BID ITEMS

Provide unit prices for increased (additive) or reduced (deductive) quantities of the following Additive and Deductive (AD) Unit Price Work Bid Items. Lump Sum Bid Price shall include the Base Bid Quantity noted for each AD Bid Item. Additive (Add) Unit Prices shall be for actual construction quantities in excess of the Base Bid Quantity. Deductive (Deduct) Unit Prices shall be for quantities less than the Base Bid Quantity. Engineer shall confirm all quantities for Additive or Deductive Unit Price Work Bid Items.

AD-1. Rock Excavation
Base Bid Quantity included with Lump Sum Bid: **Quantity Undetermined**
Add $_____ per Cubic Yard for additional Rock Excavation Write in Amount:

Bidder Identification and Signatures

Name of Firm: _____

Federal Tax ID No: _____

State of Incorporation and Oregon CCB License No: _____

Bidder ☐ IS / ☐ IS NOT a "Resident Bidder" as defined by ORS 279.029.

Signature and Printed Name(s): *(If Bidder is a partnership or joint venture, all parties must sign below)*

_____ _____

_____ _____

Title _____

Date _____

END OF SECTION

BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Bid**
Name: City of Sweet Home, Oregon	Project *(name and location)*:
Address *(principal place of business)*:	Mahler Water Reclamation Facility Sludge Blend Tank Design-Build 1357 Pleasant Valley Road Sweet Home, OR 97386
3225 Main Street Sweet Home, OR 97386	Bid Due Date: January 10, 2023
Bond	
Penal Sum:	
Date of Bond:	

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	Surety
_____	_____
(Full formal name of Bidder)	*(Full formal name of Surety) (corporate seal)*
By: _____	By: _____
(Signature)	*(Signature) (Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title:	Title:

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

EJCDC® C-430, Bid Bond (Penal Sum Form).
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1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
    3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
    3.2. All Bids are rejected by Owner, or
    3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

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SECTION 00 43 37 - FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

(To Be Submitted After Bid)

FOR

CITY OF SWEET HOME
MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD

Bid Closing: **January 10, 2023** at 2:00 p.m.

Disclosure Submittal Deadline**: January 10, 2023** at 4:00 p.m.

This form must be completed, signed and submitted at the location specified in the Invitation to Bid on the advertised bid closing date and within two working hours after the advertised bid closing time.

Bidders are required to disclose information about certain first-tier subcontractors (see ORS 279C.370). Specifically, when the contract amount of a first-tier subcontractor furnishing labor and material would be greater than or equal to: (i) 5% of the project Bid, but at least $15,000; or (ii) $20,000 regardless of the percentage, the Bidder must disclose the following information about that subcontractor either in its Bid submission, or within two hours after Bid Closing.

List below the names of each subcontractor that will be furnishing labor or furnishing labor and materials and that are required to be disclosed, the category of work that the subcontractor will be performing and the dollar value of the subcontract. Enter 'NONE' if there are no subcontractors that are required to be disclosed. (ATTACH ADDITIONAL SHEETS IF NEEDED).

Subcontractor Name	Dollar Value	Category of Work

Failure to submit this form by the disclosure deadline will result in a nonresponsive bid. A nonresponsive bid will not be considered for award.

Form Submitted by (Bidder Name): _____

Contact Name: _____ **Phone No.:** _____

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SECTION 00 45 19 – NON-COLLUSION AFFIDAVIT

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN-BUILD
CITY OF SWEET HOME, OREGON

STATE OF OREGON
COUNTY OF LINN

I state that I am_____(title) of_____(name of firm) and that I am authorized to make this affidavit on behalf of my firm and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder, except as disclosed on the attached appendix.

(2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

(5) _____(name of firm), its affiliates, subsidiaries, officers, directors and employees are not currently under investigation by any governmental agency for violating any non-collusion statutes and have not in the last four years been convicted of or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described in the attached appendix.

I state that_____(name of firm) understands and acknowledges that the above representations are material and important and will be relied on by the City of Sweet Home in awarding the contract(s) for which this bid is submitted. I understand, and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the City of Sweet Home of the true facts relating to the submission of bids for this contract.

_____
Authorized Signature

_____
Name of Company / Position

Sworn to and subscribed before me this_____day of_____, 20____.

_____ _____
Notary Public for the State of Oregon My Commission Expires

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AGREEMENT
BETWEEN OWNER AND DESIGN-BUILDER
ON THE BASIS OF A STIPULATED PRICE

THIS AGREEMENT is by and between City of Sweet Home, Oregon ("Owner"), and [ ] ("Design-Builder").

PROJECT INFORMATION

Project: Mahler Water Reclamation Facility Interim Improvements Project

Design-Build Contract: Mahler Water Reclamation Facility Sludge Blend Tank Design-Build ("Contract")

Owner's Consultant: West Yost Associates, Inc .

Engineer: Design-Builder has retained [ ] ("Engineer") for the performance of professional engineering services under this Contract.

Authorized Representatives: Owner and Design-Builder each hereby designates a specific individual authorized to act as representative with respect to the performance of responsibilities under this Contract. Such an individual shall have authority to transmit instructions, receive formal notices, receive information, and render decisions relative to this Contract on behalf of the respective party that the individual represents.

1. Owner's Authorized Representative:
   West Yost Associates, Inc.
   Preston Van Meter, Principal Engineer
   5 Centerpointe Dr #130, Lake Oswego, OR 97035

   503.451.2161
   pvanmeter@westyost.com

2. Design-Builder's Authorized Representative: [ ] ***[include mailing and delivery addresses, e-mail address, telephone numbers]***

Owner and Design-Builder further agree as follows:

ARTICLE 1 – THE WORK

1.01 *General Description of Work*

A. Design-Builder shall complete all Work as specified or indicated in the Contract. The Work is generally described as the design and construction of the following: new 100,000-gallon cast-in-place concrete Sludge Blend Tank including appurtenances and associated site work.

ARTICLE 2 – CONTRACT TIMES

2.01 *Time of the Essence*

A. All time limits for Design-Builder's attainment of Milestones, if any, Substantial Completion, and completion and readiness for final payment, as stated in the Contract, are of the essence of the Contract.

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2.02 *Contract Times: Dates*

A. Design-Builder will substantially complete the Work on or before April 27, 2023.

B. Design-Builder will have the Work completed and ready for final payment, in accordance with Paragraph 14.06 of the General Conditions, on or before June 16, 2023.

C. Design-Builder shall attain the following Milestone(s):

1. Milestone 1: Design-Builder shall have submitted tank shop drawings and all associated Project submittals on or before February 9, 2023.

2.03 *Liquidated Damages*

A. Design-Builder and Owner recognize that time is of the essence as stated in Paragraph 2.01 above, and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 2.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving, in a lawsuit or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Design-Builder agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Design-Builder shall pay Owner $500 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 2.02.A above for Substantial Completion until the Work is substantially complete.

2. Completion of Remaining Work: After Substantial Completion, if Design-Builder shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Design-Builder shall pay Owner $500 for each day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion, final completion, and Milestones (if applicable) are not additive, and will not be imposed concurrently. Liquidated damages for failing to attain Substantial Completion shall take precedence.

ARTICLE 3 – CONTRACT PRICE

3.01 *Stipulated Sums*

A. Owner shall pay Design-Builder for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

1. For all Work other than Unit Price Work, a lump sum of: $[ ].

3.02 *Changes in Contract Price Based on Cost of the Work*

A. If the price of Design Professional Services covered by a Change Order or an adjustment in the Contract Price is determined on the basis of Cost of the Work, then for such Design Professional Services (exclusive of reimbursable expenses, if any) the Engineer, Project Design Professional, or other design entity performing the Design Professional Services (regardless of tier) may invoice no more than the direct labor cost of each employee providing services multiplied by a factor of 2.7, which covers labor costs, overhead, and profit.

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B. If the value of Work covered by a Change Order or an adjustment in the Contract Price is determined on the basis of Cost of the Work, and involves Work performed under Construction Subcontracts or Design Agreements, the allowable mark-ups on lower tier invoices shall be limited as stated in Paragraph 11.05.D.2.c and d of the General Conditions.

ARTICLE 4 – PAYMENT PROCEDURES

4.01 *Submittal and Processing of Payments*

A. Design-Builder shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Owner will process Applications for Payment as provided in the General Conditions.

4.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Design-Builder's Applications for Payment on or about the 10th day of each month during performance of the Work as provided in Paragraph 4.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

a. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Owner, and if the character and progress of the Work have been satisfactory to Owner, then as long as the character and progress of the Work remain satisfactory to Owner, there will be no additional retainage; and

b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Design-Builder to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 14.01.G of the General Conditions, and less 200 percent of Owner's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

C. Notwithstanding the provisions above, no retainage shall be withheld with respect to the portion of a payment application pertaining to engineering, design, and other professional services.

4.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.06 of the General Conditions, Owner shall pay the remainder of the Contract Price.

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ARTICLE 5 – INTEREST

5.01 *Interest Rate*

A. All amounts not paid when due shall bear interest at the rate of 6 percent per annum, or if applicable at the rate stated in a governing prompt payment statute.

ARTICLE 6 – DESIGN-BUILDER'S REPRESENTATIONS

6.01 *Representations*

A. Design-Builder makes the following representations for Owner's reliance:

1. Design-Builder has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

2. Design-Builder has become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Design-Builder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Design-Builder has carefully studied all: (a) reports of explorations and tests of subsurface conditions at or adjacent to the Site, and all drawings of physical conditions relating to existing surface or subsurface structures at the Site, if any, that Owner has identified or made available to Design-Builder, especially with respect to Technical Data in such reports and drawings, and (b) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site, that Owner has identified or made available to Design-Builder, especially with respect to Technical Data in such reports and drawings.

5. Design-Builder has considered the information known to Design-Builder itself, and to Construction Subcontractors and Project Design Professionals that Design-Builder has selected as of the Effective Date; information commonly known to design professionals, design-builders, and contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings (if any) identified in the Contract Documents or otherwise made available to Design-Builder, with respect to the effect of such information, observations, and documents on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Design-Builder; and (c) Design-Builder's safety precautions and programs.

6. Based on the information and observations referred to in the preceding paragraph, Design-Builder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary prior to entry into the Contract at the Contract Price, subject to the Contract Times.

7. Design-Builder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

8. Design-Builder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Design-Builder has discovered in the Contract Documents, and the written response from Owner is acceptable to Design-Builder.

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9. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

10. Design-Builder's entry into this Contract constitutes an incontrovertible representation by Design-Builder that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 7 – CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement.
2. Performance bond.
3. Payment bond.
4. General Conditions.
5. Technical Specifications
6. Conceptual Documents:
    a. Cover Sheet, Vicinity and Location Maps
    b. Overall Site Plan and Staging Areas Plan
    c. Solids Area Detail Plan & Details
    d. Tank Mechanical Sections and Details
    e. Structural Design Criteria
7. Addenda (numbers [ ] to [ ], inclusive).
8. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Work Change Directives.
    b. Change Orders.
    c. Record Drawings and Record Specifications

B. The documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 8 – MISCELLANEOUS

8.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and Supplementary Conditions.

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8.02 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on the other party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

8.03 *Successors and Assigns*

A. Owner and Design-Builder each binds itself, its successors, assigns, and legal representatives to the other party hereto, and its successors, assigns, and legal representatives, in respect to all covenants, agreements, and obligations contained in the Contract.

8.04 *Severability*

A. Any provision or part of the Contract held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Design-Builder, who agree that the Contract shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

8.05 *Design-Builder's Certifications*

A. Design-Builder certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.05:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

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IN WITNESS WHEREOF, Owner and Design-Builder have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

OWNER:	DESIGN-BUILDER:
City of Sweet Home, Oregon	
By:	By:
Title:	Title:
	[If Design-Builder is a corporation, partnership, LLC, or a joint venture, attach evidence of authority to sign. In the case of a joint venture, expand the signature section to accommodate execution of the Agreement by an authorized representative of each joint venturer.]
Attest:	Attest:
Title:	Title:
Address for giving notices:	Address for giving notices:
3225 Main Street	
Sweet Home, OR 97386	
	License No.: _____ *(where applicable)*
[If Owner is a corporation, partnership, or LLC, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.]	***NOTE(S) TO USER: Use in those states or other jurisdictions where licensing is applicable or required.***

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ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

DESIGN-BUILD PERFORMANCE BOND

DESIGN-BUILDER *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER: **City of Sweet Home**
1400 24th Ave., Sweet Home, OR 97386

DESIGN-BUILD CONTRACT
Effective Date of the Contract:
Amount:
Description *(name and location)*:

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Design-Builder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Design-Build Performance Bond to be duly executed by an authorized officer, agent, or representative. ***[Note: Provide supplemental execution by any additional parties, such as joint venturers.]***

DESIGN-BUILDER AS PRINCIPAL	**SURETY**
Design-Builder's Name	Surety's Name
By: Signature	**By:** Signature *(attach power of attorney)*
Print Name	Print Name
Title	Title
Attest: Signature	**Attest:** Signature
Title	Title

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1. The Design-Builder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Design-Build Contract, which is incorporated herein by reference.

2. If the Design-Builder performs the Design-Build Contract, the Surety and the Design-Builder shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Design-Build Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Design-Builder and the Surety that the Owner is considering declaring a Design-Builder Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Design-Builder, and Surety to discuss the Design-Builder's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Design-Builder, and the Surety agree, the Design-Builder shall be allowed a reasonable time to perform the Design-Build Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Design-Builder Default;

3.2 The Owner declares a Design-Builder Default, terminates the Design-Build Contract, and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Design-Build Contract Price in accordance with the terms of the Design-Build Contract to the Surety, or to a design-builder or contractor selected to perform the Design-Build Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Design-Builder, with the consent of the Owner, to perform and complete the Design-Build Contract;

5.2 Undertake to perform and complete the Design-Build Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified design-builders or contractors acceptable to the Owner for a contract for performance and completion of the Design-Build Contract, arrange for a contract to be prepared for execution by the Owner and a design-builder or contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Design-Build Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Design-Build Contract Price incurred by the Owner as a result of the Design-Builder Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new design-builder or contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

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7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Design-Builder under the Design-Build Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Design-Build Contract. Subject to the commitment by the Owner to pay the Balance of the Design-Build Contract Price, the Surety is obligated, without duplication, for:

7.1 the responsibilities of the Design-Builder for correction of defective work and completion of the Design-Build Contract;

7.2 additional legal, design professional, and delay costs resulting from the Design-Builder's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Design-Build Contract, actual damages caused by delayed performance or non-performance of the Design-Builder.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Design-Builder that are unrelated to the Design-Build Contract, and the Balance of the Design-Build Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Design-Build Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction where the construction portion of the Project is located, and shall be instituted within two years after a declaration of Design-Builder Default, or within two years after the Design-Builder ceased working, or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice under this Bond to the Surety, the Owner, or the Design-Builder shall be in writing, and mailed or delivered to the recipient's address as shown in this Bond.

13. When this Bond has been furnished to comply with a statutory or other legal requirement where the construction portion of the Project is located, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted from this Bond and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Design-Build Contract Price: The total amount payable by the Owner to the Design-Builder under the Design-Build Contract after all proper adjustments have been made including allowance for the Design-Builder for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Design-Builder is entitled, reduced by all valid and proper payments made to or on behalf of the Design-Builder under the Design-Build Contract.

14.2 Design-Build Contract: The agreement between the Owner and Design-Builder identified as such in this Bond, including all Contract Documents and changes duly made to such Design-Build Contract.

14.3 Design-Builder Default: Failure of the Design-Builder, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Design-Build Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Design-Builder as required under the Design-Build Contract, or to perform and complete or comply with the other material terms of the Design-Build Contract.

14.5 Contract Documents: All the documents that comprise the contract between the Owner and Design-Builder.

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15. Any singular reference to Design-Builder, Surety, Owner, or other party shall be considered plural where applicable.

16. Modifications to this Bond are as follows:

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DESIGN-BUILD PAYMENT BOND

DESIGN-BUILDER *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*: **City of Sweet Home**
1400 24th Ave., Sweet Home, OR 97386

DESIGN-BUILD CONTRACT

Effective Date of the Contract:
Amount:
Description *(name and location)*:

BOND

Bond Number:
Date *(not earlier than the Effective Date of the Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Design-Builder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative. ***[Note: Provide supplemental execution by any additional parties, such as joint venturers.]***

DESIGN-BUILDER AS PRINCIPAL	**SURETY**
_____	_____
Design-Builder's Name	Surety's Name
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

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1. The Design-Builder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, services, materials, and equipment furnished for use in the performance of the Design-Build Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Design-Builder promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, services, materials, or equipment furnished for use in the performance of the Design-Build Contract, then the Surety and the Design-Builder shall have no obligation under this Bond.

3. If there is no Owner Default under the Design-Build Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Design-Builder and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, services, materials, or equipment furnished for use in the performance of the Design-Build Contract, and tendered defense of such claims, demands, liens, or suits to the Design-Builder and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

5.1 Claimants that do not have a direct contract with the Design-Builder,

5.1.1 have furnished a written notice of non-payment to the Design-Builder, stating with substantial accuracy the amount claimed and the name of the party to which the materials were, or equipment was, furnished or supplied, or for which the labor was done or performed, within ninety (90) days after having last performed labor or services, or last furnished materials or equipment included in the Claim; and

5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).

5.2 Claimants who are employed by or have a direct contract with the Design-Builder have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Design-Builder, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

7.2 Pay or arrange for payment of any undisputed amounts.

7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Design-Builder may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

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8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Design-Builder under the Design-Build Contract shall be used for the performance of the Design-Build Contract and to satisfy claims, if any, under any design-build performance bond. By the Design-Builder furnishing and the Owner accepting this Bond, they agree that all funds earned by the Design-Builder in the performance of the Design-Build Contract are dedicated to satisfy obligations of the Design-Builder and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Design-Builder that are unrelated to the Design-Build Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Design-Build Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction where the construction portion of the Project is located, or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Design-Build Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Design-Builder shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement where the construction portion of the Project is located, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted from this Bond and provisions conforming to such statutory or other legal requirement shall be deemed incorporated here. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Design-Builder and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the individual or entity for which the labor or services were done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, services, materials, or equipment were furnished for use in the performance of the Design-Build Contract;
4. A brief description of the labor, services, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or services, or last furnished materials or equipment, for use in the performance of the Design-Build Contract;
6. The total amount earned by the Claimant for labor, services, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and

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8. The total amount due and unpaid to the Claimant for labor, services, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Design-Builder or with a subcontractor of the Design-Builder to furnish labor, services, materials, or equipment for use in the performance of the Design-Build Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, services, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Design-Build Contract, architectural and engineering services required for performance of the work of the Design-Builder and the Design-Builder's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Design-Build Contract:** The agreement between the Owner and Design-Builder identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default**: Failure of the Owner, which has not been remedied or waived, to pay the Design-Builder as required under the Design-Build Contract, or to perform and complete or comply with the other material terms of the Design-Build Contract.

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Design-Builder.

17. Any singular reference to Design-Builder, Surety, Owner, or other party shall be considered plural where applicable.

18. Modifications to this Bond are as follows:

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STANDARD GENERAL CONDITIONS OF THE CONTRACT BETWEEN OWNER AND DESIGN-BUILDER

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STANDARD GENERAL CONDITIONS OF THE CONTRACT BETWEEN OWNER AND DESIGN-BUILDER

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Contract Documents and printed with initial capital letters, the following terms have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda:* Written or graphic instruments issued by Owner prior to the opening of Proposals which clarify, correct, or change the Request for Qualifications, Request for Proposals, or the proposed Contract Documents, including the Conceptual Documents.

2. *Agreement:* The written instrument, executed by Owner and Design-Builder, that sets forth the Contract Price and Contract Times, identifies the parties, and designates the specific items that are Contract Documents.

3. *Application for Payment:* The form which is to be used by Design-Builder during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Authorized Representative:* The individual designated by a party to represent it with respect to this Contract, as indicated in the Agreement.

5. *Change Order:* A document which is signed by Design-Builder and Owner and authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

6. *Claim:* A demand or assertion by Owner or Design-Builder seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A request or proposal for a Change Order is not a Claim.

7. *Conceptual Documents:* The documents prepared by or for the Owner to describe the Work to be performed, issued to Proposers during the design-builder selection process, and expressly identified in the Agreement.

8. *Constituent of Concern:* Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other Laws or Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

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9. *Construction:* The part of the Work that consists generally of making physical improvements at the Site, and is the result of performing or furnishing of labor, the furnishing and incorporating of materials and equipment into the Work (including any correction of defective Construction), and the furnishing of services (other than Design Professional Services) and documents, all as required by the Contract Documents and Construction Drawings and Construction Specifications, as duly modified.

10. *Construction Drawings:* Documents prepared by or for Design-Builder, and approved by Owner for purposes of allowing Design-Builder to proceed with the Construction or specific portions of the Construction, and consisting of drawings, diagrams, illustrations, schedules, and other data that graphically show the scope, extent, and character of the Construction (or specific portions of the Construction) to be performed by or for Design-Builder. Construction Drawings are not Contract Documents.

11. *Construction Specifications:* Documents prepared by or for Design-Builder, and approved by Owner for purposes of allowing Design-Builder to proceed with the Construction or a specific portion of the Construction, and consisting of written requirements for materials, equipment, systems, standards, workmanship, and administrative procedures as applied to the Construction (or a specific portion of the Construction). Construction Specifications are not Contract Documents.

12. *Construction Subcontract:* A written agreement between Design-Builder and a Construction Subcontractor for provision of all or a portion of the Construction, and any delegated Design Professional Services.

13. *Construction Subcontractor:* An individual or entity (other than a Supplier) having a direct contract with Design-Builder or with any other Construction Subcontractor for the performance of a part of the Construction, and any delegated Design Professional Services.

14. *Contract:* The entire and integrated written agreement between Owner and Design-Builder concerning the Work.

15. *Contract Documents:* Those items so designated in the Agreement, and which together comprise the Contract.

16. *Contract Price:* The money that Owner has agreed to pay Design-Builder for completion of the Work in accordance with the Contract Documents.

17. *Contract Times:* The numbers of days or the dates stated in the Agreement to (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

18. *Design-Builder:* The individual or entity with which Owner has contracted for performance of the Work, as designated in the Agreement.

19. *Design Professional Services:* That part of the Work comprised of the furnishing of engineering, surveying, architecture, and other design services, and including but not limited to providing research, analysis, and conclusions regarding engineering and related matters; exercising professional judgment with respect to technical issues; the preparation of plans, reports, calculations, models, schematics, drawings, specifications, Design Submittals, the Construction Drawings, Construction Specifications, and other instruments of service; other services included in the Contract Documents and required to be performed by or under the responsible charge of licensed design professionals; and

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the review of shop drawings, observation of construction, response to requests for information or interpretation, analysis of the technical aspects of Change Orders, and other engineering and related professional services provided by or for licensed design professionals during Construction.

20. *Design Agreement:* A written agreement between Design-Builder and a design firm or entity for provision of Design Professional Services.

21. *Design Submittal:* A Submittal that pursuant to Laws and Regulations or this Contract must be prepared by or under the supervision of a licensed engineer or other licensed design professional, including drawings, specifications, Construction Drawings, Construction Specifications, and revisions to such documents (but not including Record Documents).

22. *Effective Date of the Contract:* The date indicated in the Agreement on which the Contract becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

23. *Engineer:* The Project Design Professional identified as Engineer in the Agreement, and engaged by Design-Builder to provide engineering and related professional services under a Design Agreement.

24. *Hazardous Environmental Condition:* The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations:* Any and all applicable laws, statutes, rules, regulations, ordinances, binding resolutions, codes, decrees, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens:* Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone:* A principal event in the performance of the Work that the Contract requires Design-Builder to achieve by an intermediate completion date or by a time prior to Substantial Completion of Construction.

28. *Notice of Award:* The written notice by Owner to a Proposer stating that Owner will enter into the design-build contract with the Proposer.

29. *Notice to Proceed*: A written notice by Owner to Design-Builder fixing the date on which the Contract Times will commence to run and on which Design-Builder shall start to perform the Work.

30. *Owner:* The individual or entity with which Design-Builder has contracted regarding the Work, and which has agreed to pay Design-Builder for the performance of the Work, pursuant to the terms of the Contract.

31. *Owner's Consultant:* An individual or entity with which the Owner has contracted to furnish services (typically including planning, preparation of Conceptual Documents, and

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advisory services) to Owner with respect to the Project, and which is identified as such in the Agreement.

32. *Owner's Site Representative:* A representative of Owner at the Site, as indicated in Paragraph 10.05.

33. *Project:* The total undertaking to be accomplished for Owner by engineers, consultants, Design-Builder, subcontractors, and others, including planning, study, design, construction, testing, start-up, and commissioning, and of which the Work to be performed under the Contract Documents is a part.

34. *Project Design Professionals:* The Engineer and any other independent entities or individuals, or employees of Design-Builder, engaged by Design-Builder or a Construction Subcontractor to provide Design Professional Services with respect to a portion of the Work.

35. *Proposal:* The documents submitted by Design-Builder in response to the Request for Proposals, setting forth technical concepts, proposed prices, and other conditions for the Work to be performed, and stating any proposed revisions, modifications, clarifications, exceptions, or supplements to the proposed Contract Documents.

36. *Proposal Amendment:* A Contract Document that is prepared after submittal of Design-Builder's Proposal; identifies mutually agreed revisions, modifications, exceptions, supplements, and clarifications to the Proposal or proposed Contract Documents; and is executed by Owner and Design-Builder.

37. *Proposer:* An entity that submits a Statement of Qualifications or Proposal to Owner.

38. *Record Documents:* The record copy of all Construction Drawings, Construction Specifications, Addenda, Change Orders, Work Change Directives, and approved Submittals maintained by Design-Builder at the Site, including any annotations to such documents made by Design-Builder during Construction.

39. *Record Drawings and Record Specifications:* Documents depicting the completed Project, or a specific portion of the completed Project, based on or comprised of the Record Documents delivered to Owner by Design-Builder at the completion of the Construction.

40. *Request for Proposals:* The document prepared by or for Owner specifying and describing Owner's objectives, the procedures to be followed in preparing and submitting a Proposal, and the process for evaluating Proposals and awarding a contract.

41. *Request for Qualifications:* The document prepared by or for Owner requesting that Proposers submit a Statement of Qualifications with respect to their candidacy for selection as Design-Builder.

42. *Schedule of Values:* A schedule, prepared and maintained by Design-Builder, allocating portions of the Contract Price to various portions of the Work, and used as the basis for reviewing Design-Builder's Applications for Payment.

43. *Site:* Lands or areas indicated in the Contract Documents as being furnished by Owner upon which Construction is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for use of Design-Builder.

44. *Statement of Qualifications:* The document submitted by a Proposer in response to the Request for Qualifications, including any completed forms, attachments, and exhibits.

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45. *Submittal*: A written or graphic document, prepared by or for Design-Builder, which the Contract Documents require the Design-Builder to submit to the Owner. Submittals may include reports, preliminary drawings and specifications, cost estimates, proposed Construction Drawings and Construction Specifications, progress schedules, cash flow projections, Schedules of Values, shop drawings, product data, samples, delegated designs, certifications, proposed modifications to the Construction Drawings and Construction Specifications, results of tests and evaluations, results of source quality control testing and inspections, results of field or Site quality control testing and evaluations, sustainable design information, information on special procedures, operations and maintenance data, sustainable design closeout information, record documents, records of spare parts and extra stock materials, and other such documents required by the Contract Documents. Submittals, whether approved or accepted by Owner or not, are not Contract Documents. Claims, notices, Change Orders, Applications for Payment, and requests for information/interpretation are not Submittals.

46. *Substantial Completion:* The time at which the Construction (or a specified part thereof) has progressed to the point where it is sufficiently complete, in accordance with the Contract Documents, so that the Construction (or the specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Construction refer to Substantial Completion thereof.

47. *Supplementary Conditions:* The part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier:* A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Design-Builder or with any Construction Subcontractor to furnish materials or equipment to be incorporated in the Work by Design-Builder or a Construction Subcontractor, and any lessor of rental equipment used by Design-Builder or a Construction Subcontractor during Construction at the Site.

49. *Technical Data:* Data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding (a) subsurface conditions at the Site, (b) physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), or (c) environmental conditions at the Site, that are set forth in any geotechnical or environmental report prepared for the Project and relied upon by Design-Builder in agreeing to a price (either stipulated, or a Guaranteed Maximum Price) that includes Construction.

50. *Underground Facilities:* All underground lines, pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems, including but not limited to those that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, fire or police signal systems, or traffic or other control systems; and any encasements containing such facilities or systems.

51. *Underground Facilities Data:* Information and data shown or indicated in the Contract Documents or otherwise provided to Design-Builder by Owner with respect to existing Underground Facilities at or adjacent to the Site.

52. *Unit Price Work:* Work to be paid for on the basis of unit prices.

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53. *Work:* The entire design and construction or the various separately identifiable parts thereof required to be performed or furnished by Design-Builder under the Contract Documents. Work includes and is the result of performing or furnishing Design Professional Services and Construction required by the Contract Documents and all labor, services, and documentation necessary to produce such Design Professional Services and Construction; furnishing, installing, and incorporating all materials and equipment into such Construction; and related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

54. *Work Change Directive:* A written directive to Design-Builder, issued on or after the Effective Date of the Contract, signed by Owner, ordering an addition, deletion or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B are not defined terms that require initial capital letters, but when used in the Contract Documents have the indicated meanings.

B. *Intent of Certain Terms or Adjectives:*

1. The word "day" shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

2. The word "defective," when modifying the word "Construction" refers to Construction that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to Owner's final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion) provided that the defect was not caused by Owner.

3. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

4. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials or equipment or equipment complete and ready for intended use.

5. The words "perform" or "provide" when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

6. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Design-Builder, "provide" is implied.

7. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with that meaning.

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ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. *Bonds:* When Design-Builder delivers the executed Agreements to Owner, Design-Builder shall also deliver to Owner such Bonds as Design-Builder may be required to furnish in accordance with Paragraph 6.01.A.

B. *Evidence of Insurance*: Before any Work is started, Design-Builder and Owner shall each deliver to the other those certificates of insurance that Design-Builder and Owner respectively are required to purchase and maintain in accordance with Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Design-Builder four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract. Owner shall make such original printed record version of the Contract available to Design-Builder for review.

2.03 *Conceptual Documents*

A. *Design-Builder's Review of Conceptual Documents:*

1. Design-Builder acknowledges that the Conceptual Documents furnished by Owner are preliminary and incomplete, and subject to stated limitations and reservations.

2. Design-Builder shall carefully review, analyze, and verify the contents and suitability of the Conceptual Documents before proceeding with the Work (including but not limited to the Design Professional Services).

3. Design-Builder shall promptly report in writing to Owner any conflict, error, ambiguity, or discrepancy that Design-Builder may discover in the Conceptual Documents, whether during such review or at any later point.

4. Upon receipt of a report from Design-Builder that there is a conflict, error, ambiguity, or discrepancy in the Conceptual Documents, Owner shall either provide a written interpretation, clarification, or correction to Design-Builder, or authorize Design-Builder to correct or resolve the issue under a Change Order providing an equitable adjustment in Contract Times or Contract Price, or both.

5. Design-Builder shall not proceed with any Work affected by a reported conflict, error, ambiguity, or discrepancy in the Conceptual Documents until the issue is resolved.

B. Owner shall not be responsible for any deficiency in the Conceptual Documents that Design-Builder does not discover or report to Owner.

C. Subject to the foregoing review and reporting obligations, Design-Builder may use the Conceptual Documents as a partial basis for performing or furnishing Design Professional Services, including the preparation of Design Submittals such as the Construction Drawings and Construction Specifications, but despite any such use of the Conceptual Documents the Design-Builder nonetheless shall be responsible to Owner for the quality and soundness of the Design Professional Services.

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2.04 *Before Starting the Work*

A. *Preliminary Schedules:* Within 10 days after commencement of the Contract Times (unless otherwise specified in the Contract Documents), Design-Builder shall submit the following to Owner for Owner's timely review:

1. Three (3) copies of a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. A preliminary schedule of Submittals (including Design Submittals) which will list each required Submittal and the times for submitting, reviewing, and processing each Submittal;

3. A preliminary Schedule of Values for all of the Work which will include quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work; and

4. A preliminary cash flow projection estimating that portion of the Contract Price to be due during each month of performance.

2.05 *Authorized Representatives*

A. The Authorized Representative for each party has been designated in the Agreement. A party may change its Authorized Representative at any time by giving notice to the other party of the name, mailing and delivery addresses, e-mail address, and telephone numbers of the new Authorized Representative.

2.06 *Initial Conference*

A. Within 20 days after the Contract Times start to run, Design-Builder will arrange a conference attended by Owner and Design-Builder and others as appropriate to establish a working understanding among the parties as to the Work and to discuss the design concepts, schedules referred to in Paragraph 2.04.A, procedures for handling Submittals, processing Applications for Payment, maintaining required records, and other matters.

2.07 *Review of Schedules*

A. Not less than 10 days before submission of the first Application for Payment (unless otherwise provided in the Contract Documents), Design-Builder will arrange a conference attended by Design-Builder, Owner, and others as appropriate to review and discuss the schedules submitted in accordance with Paragraph 2.04.A. Design-Builder shall have an additional 10 days after the conference to make corrections and adjustments and to complete and resubmit the schedules for Owner's acceptance. No progress payment shall be made to Design-Builder until Design-Builder submits schedules that comply with the following requirements:

1. Design-Builder's progress schedule shall provide an orderly progression of the Work to completion within any specified Milestones and the Contract Times.

2. Design-Builder's schedule of Submittals shall provide a workable arrangement for submitting, reviewing, and processing Submittals in accordance with Article 8.

3. Design-Builder's Schedule of Values shall provide a reasonable allocation of the Contract Price to component parts of the Work.

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2.08 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Design-Builder may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. Electronic Documents Protocol: The parties shall conform to the following provisions in Paragraphs 2.08.B and 2.08.C, together referred to as the Electronic Documents Protocol ("EDP" or "Protocol") for exchange of electronic transmittals.

1. Basic Requirements

a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.

b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.

c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.

d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.

e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.

f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 17.01 of the General Conditions.

2. System Infrastructure for Electronic Document Exchange

a. Owner will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum

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standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.

1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 7 MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.

2) 2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.

b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.

c. Each party will operate and maintain industry-standard, industry-accepted, ISO standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.

d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.

e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.

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g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.

h. The Owner will operate a Project information management system (also referred to in this EDP as "Project Website") for use of Owner, Engineer and Design-Builder during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this EDP or the General Conditions, use of the Project Website by the parties as described in this Paragraph will be mandatory for exchange of Project documents, communications, submittals, and other Project-related information. The following conditions and standards will govern use of the Project Website:

1) Describe the period of time during which the Project Website will be operated and be available for reliance by the parties;

2) Provide any minimum system infrastructure, software licensing and security standards for access to and use of the Project Website;

3) Describe the types and extent of services to be provided at the Project Website (such as large file transfer, email, communication and document archives, etc.); and

4) Include any other Project Website attributes that may be pertinent to Design-Builder's use of the facility and pricing of such use.

C. Software Requirements for Electronic Document Exchange; Limitations

1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.

a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.

2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.

3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

D. Requests by Design-Builder for Electronic Documents in Other Formats

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.

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2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Design-Builder ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Design-Builder agrees:

    a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer's purposes solely, and is being provided to Design-Builder on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Design-Builder is advised and acknowledges that the content may not be suitable for Design-Builder's application, or may require substantial modification and independent verification by Design-Builder. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

    b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Design-Builder under the request are only for convenience of Design-Builder. Any conclusion or information obtained or derived from such data will be at the Design-Builder's sole risk and the Design-Builder waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.

    c. Design-Builder shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Design-Builder's use, adaptation, or distribution of any Electronic Documents provided under the Request.

    d. Design-Builder agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Design-Builder's subcontractors. Design-Builder warrants that subsequent use by Design-Builder's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.

3. In the event that Owner elects to provide or directs the Engineer to provide to Design-Builder any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Design-Builder, the Owner shall be reimbursed by Design-Builder on an hourly basis at $250 per hour for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

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ARTICLE 3 – DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Contract Documents*

A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. It is the intent of the Contract Documents to require the design and construction of a functionally complete project (or part thereof).

C. Design-Builder shall prepare or furnish Construction Drawings and Construction Specifications that are in accord with the Contract Documents and that describe a functionally complete Project (or part thereof) to be constructed in accordance with such Construction Drawings and Construction Specifications, as duly modified.

D. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

E. Design-Builder will furnish or perform all labor, documentation, services (including professional services), materials, and equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result whether or not specifically called, for at no additional cost to Owner.

3.02 *Reference Standards*

A. *Standards, Specifications, Codes, Laws or Regulations:*

1. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect on the Effective Date except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or instruction of a Supplier, shall be effective to change the duties and responsibilities of Owner, Design-Builder, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Owner or its officers, directors, members, partners, employees, agents, consultants, or subcontractors any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Resolving Discrepancies*

A. If there is a discrepancy between (1) the Conceptual Documents or other Contract Documents issued with the Request for Qualifications or Request for Proposals and (2) the Proposal, the Proposal will control.

B. If there is a discrepancy between (1) the Conceptual Documents, other Contract Documents issued with the Request for Qualifications or Request for Proposals, or the Proposal and (2) the Proposal Amendment, the Proposal Amendment will control.

C. If there is a discrepancy between (1) the Contract Documents and (2) the Construction Drawings and Construction Specifications, the Contract Documents will control unless Design-Builder gave notice of the discrepancy in a Submittal, and Owner approved the Submittal, pursuant to the provisions of Article 8.

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3.04 *Ownership and Reuse of Documents*

A. All documents prepared for or furnished to Owner by Design-Builder pursuant to this Contract (including but not limited to Design Submittals) are instruments of service. With respect to such documents:

1. Design-Builder shall have and retain the ownership, title, and property rights, including copyright, patent, intellectual property, and common law rights, in the documents.

2. During the course of the Project, Design-Builder will provide copies of Design Submittals to Owner for purposes of review and comment. Owner may retain copies of such documents for its records.

3. Owner may use its copy of the Record Drawings and Record Specifications for Owner's purposes in operating and maintaining the constructed facilities.

4. Upon Owner's termination of this Contract for cause pursuant to Paragraph 15.02, Owner shall receive a limited, non-exclusive license to use any completed Design Submittals in continuing the Project, subject to the limitations in this Paragraph 3.04.

5. The documents prepared or furnished by Design-Builder under this Contract, regardless of ownership, transfer, license, completion status, or termination of the Contract, are for Design-Builder's use, and are not intended or represented to be suitable for use on the Project by Owner or any party other than Design-Builder, or for reuse by Owner or others on extensions of the Project or on any other project, except as otherwise stated in this Contract. Any use or reuse by Owner or others on Owner's behalf will be at Owner's sole risk, and without liability or legal exposure to Design-Builder, the Project Design Professionals, or their subconsultants, and Owner shall indemnify and hold harmless Design-Builder, the Project Design Professionals, and their subconsultants from all claims, damages, losses and expenses, including attorneys' fees, arising out of or resulting from any such use or reuse.

3.05 *Order of Precedence of Contract Documents*

A. In resolving conflicts resulting from errors or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:

1. Permits from other agencies as may be required by law;

2. Addenda, Supplemental Agreements and Change Orders, the one dated later having the precedence over another dated earlier;

3. Agreement;

4. Owner's Special Provisions;

5. General Conditions (Section 00700);

6. General Requirements (Sections 01010 through 01999);

7. Other Technical Specifications (Section 02000 and all other Sections following);

8. Drawings;

9. Instructions to Bidders;

10. Bid Forms;

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11. Invitation to Bid.

B. With reference to the Drawings, the order of precedence is as follows:

1. Enumerated dimensions govern over scaled dimensions
2. Detail drawings govern over general drawings
3. Addenda/Change Order drawings govern over any other drawings
4. Contract Drawings govern over standard drawings/plans
5. Specific notes take precedence over schedules
6. Notes, descriptions or schedules take precedence over graphic representations

C. The provisions of the Contract Documents shall take precedence over any Laws or Regulations applicable to the performance of the work unless such an interpretation of the provisions of the Contract Documents would result in a violation of such Law or Regulation.

3.06 *American Iron and Steel (AIS) Requirements*

A. The Design-Builder acknowledges to and for the benefit of the City of Sweet Home ("Purchaser") and the State of Oregon (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Design-Builder pursuant to this Agreement. The Design-Builder hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Design-Builder has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Design-Builder will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Design-Builder shall permit the Purchaser or State to recover as damages against the Design-Builder any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Design-Builder has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Design-Builder agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times*

A. The Contract Times will commence to run on the Effective Date of the Contract.

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4.02 *Starting the Work*

A. Design-Builder shall start to perform the Work as of the Effective Date of the Contract. No Construction shall be done at the Site prior to the Effective Date of the Contract.

4.03 *Progress Schedule*

A. Owner may rely on the progress schedule established in accordance with Paragraph 2.04, as duly adjusted, in planning and conducting ongoing operations and other work at the Site.

B. Design-Builder shall adhere to the progress schedule established in accordance with Paragraph 2.04 as it may be adjusted from time to time, as provided below:

1. Once each month, prior to the processing of the monthly progress payment, Design-Builder shall submit to the Engineer and Owner proposed adjustments in the progress schedule that will not change the Contract Times (or Milestones). Updates must accurately reflect as-built schedule. Owner shall accept such adjustments provided that Owner, in planning and conducting ongoing operations and other work at the Site, has not reasonably relied on the schedule element that is proposed to be adjusted. If Owner has so relied, then Owner and Design-Builder shall promptly meet and seek a resolution that addresses the objectives of both parties, or adjust the Contract Price.

2. In addition, a three-week rolling "look-ahead" schedule shall be updated and provided to the Engineer at the beginning of each work week. The two-week rolling schedule shall include the Design-Builder's proposed daily activities and location(s) of work during the coming two-week period. No work shall commence at the beginning of each workweek until the updated two-week rolling schedule is submitted. During the contract period, the Design-Builder shall also coordinate his activities daily with the Engineer.

3. Design-Builder shall submit proposed adjustments in the progress schedule that will change the Contract Times (including Milestones) in accordance with the requirements of Paragraph 11.06. Such adjustments may only be made by a Change Order.

C. *Continuing the Work:* Design-Builder shall continue the Work and adhere to the progress schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as Design-Builder and Owner may otherwise agree in writing.

4.04 *Delays in Design-Builder's Progress*

A. If Owner or anyone for whom Owner is responsible delays, disrupts, or interferes with the performance or progress of the Work, then Design-Builder shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Design-Builder's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times.

B. Design-Builder shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference within the control of Design-Builder. Delay, disruption, and interference attributable to and within the control of a Project Design Professional, Construction Subcontractor, or Supplier shall be deemed to be delays within the control of Design-Builder.

C. If Design-Builder's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Design-Builder, and

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those for which they are responsible, then Design-Builder shall be entitled to an equitable adjustment in Contract Times. Design-Builder's entitlement to such an adjustment of the Contract Times is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times. Such an adjustment shall be Design-Builder's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
2. Abnormal weather conditions;
3. Acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 9); and
4. Acts of war or terrorism.
5. Weather-Related Delays
    a. If "abnormal weather conditions" as set forth in Paragraph 4.04.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.
    b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:
        1) Every workday on which one or more of the following conditions exist will be considered a "bad weather day":
            i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds 1.0 inches of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC 4.05.C by reference.
            ii) Ambient outdoor air temperature for 60 minutes between the hours of 10:00 a.m. and 3:00 p.m. is equal to or less than the following low temperature threshold: 15 degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: 100 degrees Fahrenheit.
        2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by the City of Sweet Home Public Works Department.
        3) Design-Builder shall anticipate the number of foreseeable bad weather days per month indicated in the table below —Foreseeable Bad Weather Days.

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4) Design-Builder shall include the following Foreseeable Bad Weather Days in the Progress Schedule as follows:

i) January – 3 Days

ii) February – 2 Days

iii) March – 1 Day

iv) April – 1 Days

v) May – 0 Days

vi) June – 0 Days

vii) July – 1 Days

viii) August – 2 Days

ix) September – 1 Days

x) October – 1 Day

xi) November – 2 Days

xii) December – 3 Days

5) In each month, every bad weather day exceeding the number of Foreseeable Bad Weather Days will be considered as "abnormal weather conditions." The existence of abnormal weather conditions will not relieve Design-Builder of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Design-Builder's then-current Progress Schedule's critical path for the Project.

6) If mutually agreed upon by Owner and Design-Builder, working hours during days with anticipated abnormal weather periods can be adjusted to allow work earlier or later in the day depending on the type of abnormal weather expected.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 9.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Design-Builder shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Design-Builder.

G. If Design-Builder seeks an adjustment in Contract Price or Contract Times under this paragraph, Design-Builder shall submit a request for a Change Order to Owner within 30 days of the commencement of the delaying, disrupting, or interfering event.

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ARTICLE 5 – SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Design-Builder of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Design-Builder will have to comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Design-Builder with a current statement of record legal title and legal description of the lands upon which the Construction is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws or Regulations.

C. Design-Builder shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Design-Builder shall confine construction equipment, the storage of materials and equipment and operations of workers to the work and staging areas as shown on the drawings and shall not unreasonably encumber the site and other areas with construction equipment or other materials or equipment. Design-Builder shall be responsible for keeping driveways and other main access points to the site open. Design-Builder shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work. Use of additional areas onsite or offsite may be allowed if authorized in writing by the Owner.

2. Should any claim be made by any such owner or occupant because of the performance of Work, Design-Builder shall promptly settle with such other party by negotiation, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law.

3. To the fullest extent permitted by Laws or Regulations, Design-Builder shall indemnify and hold harmless Owner, Owner's consultants, and anyone directly or indirectly employed by any of them from and against all claims, costs, losses and damages (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration or other dispute resolution costs) arising out of or resulting from any claim brought by any such owner or occupant against Owner, or any other party indemnified hereunder to the extent caused by or based upon Design-Builder's performance of the Construction.

B. *Removal of Debris:* During the performance of the Construction, Design-Builder shall keep the premises free from accumulations of waste materials, rubbish, and other debris resulting from the Construction. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws or Regulations.

C. *Cleaning:* Prior to Substantial Completion, Design-Builder shall clean the Site and make it ready for utilization by Owner. At completion of Construction, Design-Builder shall remove all tools, appliances, construction equipment, temporary construction and machinery, and

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surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Design-Builder shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Design-Builder subject any part of the Construction or adjacent property to stresses or pressures that will endanger it.

5.03 *Reference Points*

A. Design-Builder shall be responsible for laying out the Work and shall protect and preserve reference points and property monuments established by Owner, and shall make no changes or relocations of such reference points or monuments without the prior written approval of Owner. Design-Builder shall report to Owner whenever any reference point or property monument is lost or destroyed, or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

5.04 *Differing Site Conditions*

A. Design-Builder shall promptly, and before the conditions are disturbed, give a written notice to Owner of (i) subsurface or latent physical conditions at the Site (whether discovered during investigation of the Site or during Construction) which differ materially from those indicated in the Contract Documents, or in any Technical Data, or (ii) unknown physical conditions at the Site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character called for by the Contract Documents.

B. Owner will investigate the Site conditions promptly after receiving the notice. Design-Builder shall supplement the notice by promptly submitting to Owner any additional information regarding schedule and cost impacts, and a specific request for a Change Order. Owner shall then make a determination regarding the site condition and the impact, if any, on Contract Price and Contract Times. If the conditions do materially so differ and cause an increase or decrease in the Design-Builder's cost of, or the time required for, performing any part of the Work, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the Contract Price or Times modified in writing by Change Order in accordance with Article 11.

C. No request by Design-Builder for an equitable adjustment under this Paragraph 5.04 shall be allowed unless Design-Builder has given the written notice required.

D. The provisions of this Paragraph 5.04 are not intended to apply to a Hazardous Environmental Condition or Underground Facility uncovered or revealed at the Site.

5.05 *Underground Facilities*

A. *Procedure for Identifying Underground Facilities:* Promptly after the Effective Date of the Contract, Design-Builder shall review the Underground Facilities Data furnished by Owner and use ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data," as a basis for establishing a procedure ("Underground Facilities Procedure") for the further identification, investigation, and mapping of Underground Facilities at or adjacent to the Site. Design-Builder shall establish and use the Underground Facilities Procedure to aid in the provision of Design Professional Services and the performance of Construction, and to

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reduce and manage risks associated with Underground Facilities. Such Underground Facilities Procedure shall take into account the Site and the nature of the Project.

1. The Underground Facilities Procedure shall include a plan to keep Underground Facilities information current as Design-Builder proceeds with the provision of Design Professional Services, and to add new or relocated Underground Facilities information to the base utility or Site drawings.

2. To manage the potential impact of design changes on Underground Facilities, Design-Builder shall modify or reapply the Underground Facilities Procedure as the design progresses and changes.

B. *Design-Builder's Responsibilities:* Unless otherwise expressly provided in the Contract, Design-Builder shall have full responsibility for the following; and, subject to the provisions of Paragraphs 5.05.C, D, and E, the cost of all of the following will be included in the Contract Price:

1. Establishing and executing the Underground Facilities Procedure referred to in Paragraph 5.05.A, including updating, modification, and reapplication duties;

2. Coordinating the Work with the owners (including Owner) of such Underground Facilities, during the provision of Design Professional Services and Construction;

3. Verifying the actual location of specific Underground Facilities through exposure, as needed for the Design Professional Services;

4. Complying with applicable state and local utility damage prevention Laws and Regulations during Construction; and

5. The safety and protection of all existing Underground Facilities at the Site, and repairing any damage to such Underground Facilities resulting from the Construction, subject to the provisions of Paragraph 5.05.D.

C. *Results of Design-Builder's Execution of Underground Facilities Procedure:* If, during the execution of the Underground Facilities Procedure referred to in Paragraph 5.05.A, the Design-Builder identifies an Underground Facility that was not shown or indicated in the Underground Facilities Data, or was not shown or indicated with reasonable accuracy, causing an increase or decrease in the Design-Builder's cost of, or the time required for, providing Design Professional Services or performing the Construction, then Design-Builder shall submit to Owner a request for a Change Order seeking an equitable adjustment to the Contract Price or Times under this clause. Such request shall be made within 30 days of the identification of the Underground Facility in question.

D. *Underground Facility Found During Construction*: If Design-Builder believes that an Underground Facility that is uncovered, exposed, or revealed at the Site during Construction was not shown or indicated in the Underground Facilities Data, or was not shown or indicated with reasonable accuracy, and also that such Underground Facility was not identified or mapped with reasonable accuracy despite Design-Builder's adequate establishment and execution of the Underground Facilities Procedure referred to in Paragraph 5.05.A, then Design-Builder shall promptly give written notice to Owner, and supplement the notice by submitting to Owner a request for a Change Order seeking an equitable adjustment to the Contract Price or Times under this clause. Such request shall be made within 30 days of the uncovering or revealing of the Underground Facility in question.

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1. *Owner's Review:* Owner will investigate the Underground Facility found during Construction promptly after receiving the notice. If Owner concurs with Design-Builder that the Underground Facility that is uncovered, exposed, or revealed at the Site was not shown or indicated in the Underground Facilities Data, or was not shown or indicated with reasonable accuracy, and further was not identified or mapped with reasonable accuracy despite Design-Builder's adequate establishment and execution of the Underground Facilities Procedure referred to in Paragraph 5.05.A, causing an increase or decrease in the Design-Builder's cost of, or the time required for, performing any part of the Work, whether or not changed as a result of the actual location, then an equitable adjustment shall be made under this clause and the Contract Price or Times modified in writing by Change Order in accordance with Article 11. If Owner does not concur with Design-Builder, then Owner shall so indicate in writing, with a specific explanation of the reason for non-concurrence.

2. No request by Design-Builder for an equitable adjustment under Paragraph 5.05.D shall be allowed unless Design-Builder has given the written notice required.

E. *Inadequate Establishment or Execution of Underground Facilities Procedure:* If Design-Builder does not establish an Underground Facilities Procedure that is (1) adequate for the Site and the nature of the Project and (2) consistent with the guidelines set forth in ASCE 38, "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data," or Design-Builder does not adequately execute a duly established Underground Facilities Procedure, then Design-Builder shall bear all costs associated with the presence of an Underground Facility that was not identified or located with reasonable accuracy, including but not limited to delay, redesign, relocation, and increased Construction costs, if such Underground Facility would have been identified and located with reasonable accuracy by an adequate and properly executed Underground Facilities Procedure that was consistent with ASCE 38.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reliance by Design-Builder on Technical Data Authorized:* Design-Builder may rely on the accuracy of the Technical Data with respect to environmental conditions at the Site.

B. Design-Builder shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

C. Design-Builder shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Design-Builder, Project Design Professionals, Construction Subcontractors, Suppliers, or anyone else for whom Design-Builder is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

D. If Design-Builder encounters, uncovers, or reveals a Hazardous Environmental Condition (whether during Site investigation or during Construction) whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Design-Builder or anyone for whom Design-Builder is responsible creates a Hazardous Environmental Condition, then Design-Builder shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.16); and (3) notify

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Owner (and promptly thereafter confirm such notice in writing). Owner shall promptly determine whether to retain a qualified expert to evaluate such condition or take corrective action, if any, and take such actions as are necessary to permit Owner to timely obtain required permits and provide Design-Builder the written notice required by Paragraph 5.06.E. If Design-Builder or anyone for whom Design-Builder is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

E. Design-Builder shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Design-Builder either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

F. If after receipt of such written notice Design-Builder does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then the portion of the Work that is in the area affected by such condition shall be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 9.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Design-Builder, Project Design Professionals, Construction Subcontractors, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Contract Documents or the Technical Data, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Design-Builder or by anyone for whom Design-Builder is responsible. Nothing in this Paragraph 5.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Design-Builder shall indemnify and hold harmless Owner and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the Design-Builder's failure to control, contain, or remove a Constituent of Concern brought to the Site by Design-Builder or by anyone for whom Design-Builder is responsible, or to a Hazardous Environmental Condition created by Design-Builder or by anyone for whom Design-Builder is responsible. Nothing in this Paragraph 5.06.H shall obligate Deign-Builder to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

5.07 *Reports and Drawings*

A. The following drawings and reports are available for the Design-Builder:

1. Record Drawings for the Sweet Home Wastewater Treatment Plant.

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a. Contract Documents dated June 1973 consisting of 2 volumes, prepared by CH2M Hill, entitled " Sweet Home Wastewater Treatment Plant".

b. Construction Documents dated October 1992, prepared by Kramer Chin and Mayo, entitled "City of Sweet Home Wastewater Facilities Improvements".

c. Contract Documents dated February 1997, prepared by HGE, Inc., entitled "City of Sweet Home Wastewater Treatment Plant Improvements".

2. Site surveying completed by Udell Engineers located in Lebanon, Oregon.

3. Geotechnical Data Report (GDR) prepared by McMillen Jacobs Associates, Final dated June 2022.

4. 4No other information on existing subsurface or physical conditions is available for the Contractor.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Bonds shall be furnished in accordance with the City of Sweet Home Contract requirements. These shall include, but not be limited to, performance bond and payment bond.

1. Required Performance Bond Form: The performance bond that Contractor furnishes will be in the form of EJCDC® D 610, Performance Bond (2009 or 2016 edition).

2. Required Payment Bond Form: The payment bond that Contractor furnishes will be in the form of EJCDC® D 615, Payment Bond (2009 or 2016 edition).

B. Design-Builder shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Design-Builder's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due, or until completion of the correction period specified in Paragraph 14.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other specific provisions of the Contract. Design-Builder shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

1. After Substantial Completion, Contractor shall furnish a warranty bond issued in the form of EJCDC® C 612, Warranty Bond (2018). The warranty bond must be in a bond amount of 10 percent of the final Contract Price. The warranty bond period will extend to a date one year after Substantial Completion of the Work. Contractor shall deliver the fully executed warranty bond to Owner prior to or with the final application for payment, and in any event no later than 11 months after Substantial Completion.

2. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

C. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that

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individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Design-Builder shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

E. If the surety on a bond furnished by Design-Builder is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Design-Builder shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

F. If Design-Builder has failed to obtain a required bond, Owner may exclude the Design-Builder from the Site and exercise Owner's termination rights under Article 15.

G. Upon request to either Owner or Design-Builder from any Construction Subcontractor, Project Design Professional, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, the recipient of the request shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Design-Builder shall obtain and maintain insurance as required in this Article and City of Sweet Home Special Provisions.

B. Design-Builder's insurance required by the Contract shall be primary over Owner's insurance and shall include a waiver of subrogation against Owner and Engineer.

C. All insurance required by the Contract to be purchased and maintained by Owner or Design-Builder shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

D. All insurance required by the Contract to be purchased and maintained by Design-Builder shall be primary and without contribution by insurance maintained by Owner.

E. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract.

F. Design-Builder shall require (a) its Construction Subcontractors and Engineer (and any other Project Design Professional that is an independent individual or entity) to purchase and maintain commercial general liability, automobile liability, workers' compensation, employer's liability, professional liability (as applicable), and umbrella or excess liability insurance, and (b) its Construction Subcontractors to purchase and maintain contractor's pollution liability insurance. All such required insurance shall meet the same requirements for the applicable category of insurance established in this Contract for Design-Builder, unless otherwise indicated in the Supplementary Conditions.

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G. Design-Builder shall deliver to Owner, with copies to each additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Design-Builder has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Design-Builder shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, documentation of applicable self-insured retentions (if permitted) and deductibles, and evidence of insurance required to be purchased and maintained by Design-Builder's Construction Subcontractors, Engineer, and any other Project Design Professional that is an independent individual or entity. Design-Builder may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

H. Owner shall deliver to Design-Builder, with copies to each additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Design-Builder or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

I. Failure of Owner or Design-Builder to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Design-Builder to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

J. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

K. If Design-Builder has failed to obtain and maintain required insurance, Owner may exclude the Design-Builder from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 15.

L. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

M. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Design-Builder or Design-Builder's interests.

N. The insurance and insurance limits required herein shall not be deemed as a limitation on Design-Builder's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Design-Builder's Insurance*

A. Required Insurance: Design-Builder shall purchase and maintain Worker's Compensation, Commercial General Liability, Builders Risk and other insurance pursuant to the specific requirements set forth herein.

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B. General Provisions: The policies of insurance required by this Paragraph 6.03 must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 14.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Design-Builder, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. Additional Insureds: The Design-Builder's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds the following:

   a. OWNER: "City of Sweet Home, its officers, employees, agents, and consultants"; AND

   b. ENGINEER: "West Yost Associates Inc., its officers, employees, agents, and consultants"; AND

   c. any individuals or entities identified as additional insureds herein.

2. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

3. not seek contribution from insurance maintained by the additional insured; and

4. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Design-Builder's acts or omissions, or the acts and omissions of those working on Design-Builder's behalf, in the performance of Contractor's operations.

D. *Other Additional Insureds*: As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds the Owner and Engineer.

E. *Workers' Compensation and Employer's Liability Insurance:* Design-Builder shall purchase and maintain Worker's Compensation and Employer's Liability Insurance. This insurance shall protect Design-Builder against all claims under applicable state workers' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. Design-Builder shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This policy shall include an "all

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states" or "other states" and waiver of subrogation endorsements. The liability limits, as required by state law shall be not less than:

1. Workers' Compensation: Statutory
2. Employer's Liability: $1,000,000 each occurrence

F. Commercial General Liability—Claims Covered: Design-Builder shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Design-Builder, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Design-Builder's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Design-Builder's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.
    a. Such insurance must be maintained for three years after final payment.
    b. Design-Builder shall furnish Owner and each other additional insured (as identified in the General Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.19.
3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
4. Underground, explosion, and collapse coverage.
5. Personal injury coverage.
6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Design-Builder demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. Commercial General Liability Insurance Coverage: This insurance shall be occurrence type written in comprehensive form and shall protect DESIGN-BUILDER, OWNER, and ENGINEER as additional insureds, against claims arising out of performance of the Work. The policy shall also include personal injury liability coverage, contractual liability coverage, completed operations and products liability coverage, and coverage for blasting, explosion, collapse of

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buildings, and damage to underground property. The liability limits for bodily injury and property damage shall be not less than:

1. Combined Single Limit for each occurrence: $2,000,000
2. General aggregate: $2,000,000

I. Automobile Liability: Design-Builder shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	$1,000,000
Each Accident	$1,000,000
Property Damage	
Each Accident	$1,000,000
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$2,000,000

J. Umbrella Liability Insurance: Design-Builder shall purchase and maintain umbrella liability insurance. This insurance shall protect DESIGN-BUILDER, OWNER, and ENGINEER as additional insureds, against claims in excess of the limits provided under workers' compensation and employer's liability, comprehensive automobile liability, and commercial general liability policies. The umbrella policy shall follow the form of the primary insurance, including the application of the primary limits. The liability limits for bodily injury and property damage shall be not less than:

1. Combined Single Limit for each occurrence: $5,000,000
2. General aggregate: $5,000,000

K. Pollution Liability Insurance: If not otherwise included in the Design-Builder's Commercial General Liability Insurance coverage, Design-Builder shall purchase and maintain pollution liability insurance for claims arising from the discharge, dispersal, release, escape of any irritant or contaminant into or upon land, any structure, the atmosphere, watercourse, or body of water including groundwater. This shall include coverage for claims of: (a) clean up, either on-site or off site; (b) third party liability, including bodily injury, property damage, natural resource damage, third party property loss of use/revenue, and clean up; and/or (c) costs incurred for regulatory fines and/or the investigation, defense, or settlement of claims. The liability limits for pollution shall not be less than:

1. Combined Single Limit for each occurrence: $5,000,000
2. General aggregate: $5,000,000

L. Railroad Protective Liability Insurance: Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Design-Builder shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Owner, and (4)

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submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Owner of such submittal.

Railroad Protective Liability Insurance	Policy limits of not less than:
Each Claim	$ 1,000,000
Aggregate	$ 2,000,000

M. Unmanned Aerial Vehicle Liability Insurance: If Design-Builder uses unmanned aerial vehicles (UAV—commonly referred to as drones) at the Site or in support of any aspect of the Work, Design-Builder shall obtain UAV liability insurance in the amounts stated; name Owner, Engineer, and all individuals and entities identified in the General Conditions as additional insureds; and provide a certificate to Owner confirming Design-Builder's compliance with this requirement. Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy.

Unmanned Aerial Vehicle Liability Insurance	Policy limits of not less than:
Each Claim	$ 100,000
General Aggregate	$ 250,000

6.04 *Builder's Risk and Other Property Insurance*

A. Builder's Risk: Design-Builder shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the General Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the General Conditions.

B. Property Insurance for Facilities of Owner Where Work Will Occur: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. Property Insurance for Substantially Complete Facilities: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. Partial Occupancy or Use by Owner: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Design-Builder) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain

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an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. Insurance of Other Property; Additional Insurance: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Design-Builder elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Design-Builder's expense.

F. Builder's Risk Requirements: The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

    a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

    b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Design-Builder.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).

4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier). If this coverage is subject to a sublimit, such sublimit will be a minimum of $2,000,000.

5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of $2,000,000.

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6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.

7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.

8. include performance/hot testing and start-up, if applicable.

9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.

10. include as named insureds the Owner, Design-Builder, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. Parties required to be insured will be referred to collectively as "insureds." In addition to Owner, Design-Builder, and Subcontractors of every tier, include as insureds the following:

    a. West Yost Associates, Inc.

    Charles Duncan, President
    2020 Research Park Drive, Suite 100
    Davis, CA 95618
    503.756.5905; CDuncan@westyost.com

11. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of $5,000,000.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained, at Contactor's expense, in accordance with Paragraph 6.04 (or an installation floater policy if authorized), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

    1. Owner and Design-Builder waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the General Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

    2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Design-Builder as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent

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structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Design-Builder, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Design-Builder, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Design-Builder shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Design-Builder, all individuals or entities identified in the General Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the Design-Builder and Owner. Design-Builder and Owner shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer to the Design-Builder and Owner as the fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. Design-Builder and Owner receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Design-Builder shall repair or replace the damaged Work, using allocated insurance proceeds

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ARTICLE 7 – DESIGN-BUILDER'S RESPONSIBILITIES

7.01 *Design Professional Services*

A. Design-Builder shall provide the Design Professional Services needed to successfully perform and complete the Work required under this Contract.

B. *Standard of Care:* The standard of care for all Design Professional Services performed or furnished by Design-Builder under this Contract will be the care and skill ordinarily used by members of the subject profession practicing under similar circumstances at the same time and in the same locality.

7.02 *Construction*

A. Design-Builder shall perform and furnish the Construction pursuant to the Contract Documents, the Construction Drawings, and the Construction Specifications, as duly modified.

B. Design-Builder shall keep Owner advised as to the progress of the Construction.

7.03 *Supervision and Superintendence of Construction*

A. Design-Builder shall supervise, inspect, and direct the Construction competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to provide the Construction in accordance with the Contract Documents. Design-Builder shall be solely responsible for the means, methods, techniques, sequences, and procedures of Construction.

B. At all times during the progress of Construction, the Design-Builder shall assign a competent resident superintendent who shall not be replaced without written notice to Owner except under extraordinary circumstances.

7.04 *Labor; Working Hours*

A. Design-Builder shall provide competent, suitably qualified personnel to perform the Work as required by the Contract Documents. Design-Builder shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise indicated in the Contract Documents, and in the absence of any Laws or Regulations to the contrary, Design-Builder may perform the Construction on legal holidays, during any or all hours of the day, and on any or all days of the week, at Design-Builder's sole discretion.

7.05 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Design-Builder shall furnish or cause to be furnished and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified by Owner or in the Construction Drawings or Construction Specifications, and unless specified otherwise shall be new and of good quality. All warranties and guarantees specifically called for by the Contract Documents shall expressly run to the benefit of Owner. If required by Owner, Design-

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Builder shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

7.06 *"Or Equals" and Substitutions*

A. If an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, then during the preparation of the proposed Construction Drawings and Construction Specifications, the Design-Builder may request that Owner authorize the use of other items of material or equipment, or items from other proposed suppliers, by including the proposed items in the proposed Construction Drawings or Construction Specifications, with required notice to Owner that the Submittal contains a variation from the Contract Documents. Owner in its sole discretion may approve the use of the item if Owner determines that the item is functionally equal to that named and sufficiently similar so that no change in related Work will be required, taking into consideration whether the item:

1. Is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2. Will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3. Has a proven record of performance and availability of responsive service; and

4. Is not objectionable.

B. *Effect of Owner's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

C. *Substitutes:* During the preparation of the proposed Construction Drawings and Construction Specifications, the Design-Builder may propose a substitute to an item of material or equipment that is required to be furnished by the Contract Documents. Any such proposal shall be made in a transmittal to Owner that is separate from and independent of any Design Submittals. The proposal shall describe the advantages, disadvantages, and changes in Contract Price or Contract Time associated with the proposed substitute. Approval of the proposed substitute shall be at Owner's sole discretion. If approved, the substitute item shall be incorporated in the Construction Drawings and Construction Specifications.

D. *Design Professional Review:* Before Design-Builder transmits its proposal to Owner, the Project Design Professional that designed the portion of the Work affected by the proposed "or equal" or substitute shall review and approve the proposal.

E. *Construction Drawings and Construction Specifications:* "Or equal" or substitute proposals with respect to items of material or equipment that are required in the Construction Drawings and Construction Specifications shall be considered proposed modifications of the Construction Drawings and Construction Specifications, and shall be governed by the provisions of Paragraph 8.02.H.

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7.07 *Concerning Project Design Professionals, Construction Subcontractors, Suppliers, and Others*

A. Design-Builder may retain Project Design Professionals, Construction Subcontractors, and Suppliers for the performance of parts of the Work. Such Project Design Professionals, Construction Subcontractors, and Suppliers must be acceptable to Owner.

B. Design-Builder shall retain specific Project Design Professionals, Construction Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required to do so by the Contract Documents (including but not limited to the Proposal Amendment) as of the Effective Date.

C. Prior to entry into any binding Design Agreement, Construction Subcontract, or purchase order, Design-Builder shall submit to Owner the identity of the proposed Project Design Professional, Construction Subcontractor, or Supplier (unless Owner has already deemed such proposed contractual party acceptable, during the bidding process or otherwise). Such proposed contractual party shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

D. Owner may require the replacement of any Project Design Professional, Construction Subcontractor, Supplier, or other entity retained by Design-Builder to perform any part of the Work solely on the basis of substantive, reasonable objection after due investigation. Design-Builder shall submit an acceptable replacement for the rejected Project Design Professional, Construction Subcontractor, Supplier, or other entity.

E. If Owner requires the replacement of any Project Design Professional, Construction Subcontractor, Supplier, or other entity retained by Design-Builder to perform any part of the Work, then Design-Builder shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement.

F. No acceptance by Owner of Engineer or of any Project Design Professional, Construction Subcontractor, Supplier, or other entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

G. Design-Builder shall be fully responsible to Owner for all acts and omissions of the Project Design Professionals, Construction Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work, just as Design-Builder is responsible for Design-Builder's own acts and omissions.

H. Design-Builder shall be solely responsible for scheduling and coordinating the services and work of the Project Design Professionals, Construction Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

I. Design-Builder shall restrict all Project Design Professionals, Construction Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating directly with Owner, except in case of an emergency or a matter involving public health, safety, or welfare, or as otherwise expressly allowed herein.

J. Owner may furnish to any Project Design Professional, Construction Subcontractor, or Supplier, to the extent practicable, information about amounts paid to Design-Builder on account of Work performed for Design-Builder by the requesting party.

K. Nothing in the Contract Documents:

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1. Shall create for the benefit of any Project Design Professional, Construction Subcontractor, Supplier, or other third-party individual or entity any contractual relationship between Owner and such third-party individual or entity; nor

2. Shall create any obligation on the part of Owner to pay or to see to the payment of any money due any Project Design Professional, Construction Subcontractor, Supplier, or other third-party individual or entity except as may otherwise be required by Laws and Regulations.

7.08 *Patent Fees and Royalties*

A. Design-Builder shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Conceptual Documents or other Contract Documents for use in the performance of the Construction, and if to the actual knowledge of Owner its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, then Owner has disclosed the existence of such rights to Design-Builder in the Conceptual Documents or other Contract Documents.

B. To the fullest extent permitted by Laws or Regulations, Design-Builder shall indemnify and hold harmless Owner and Owner's Consultant, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the specification or incorporation in the Work of any invention, design, process, product or device, except those required by the Contract Documents.

C. To the fullest extent permitted by Laws or Regulations, Owner shall indemnify and hold harmless Design-Builder and its officers, directors, members, partners, employees or agents, Project Design Professionals, Construction Subcontractors, and Suppliers from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device required by the Contract Documents, but not identified by Owner as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

7.09 *Permits and Utility Charges*

A. The Contract Documents allocate responsibility for obtaining and paying for specified permits, licenses, certificates of occupancy, and approvals of governmental authorities having jurisdiction over the Work. Each party shall assist the other, when necessary, in obtaining such permits, licenses, certificates, and approvals.

B. Design-Builder shall pay all charges of utility owners for temporary service to the Work. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work, and for capital costs related thereto.

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7.10 *Taxes*

A. Design-Builder shall pay all sales, consumer, use, and other similar taxes required to be paid by Design-Builder in accordance with the Laws or Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

A. Design-Builder shall give all notices required by and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, Owner shall not be responsible for monitoring Design-Builder's compliance with any Laws or Regulations.

B. If Design-Builder performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Design-Builder shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work.

C. Changes in Laws or Regulations that occur after the date on which the Design-Builder committed to the Contract Price (whether by negotiation or making an offer or proposal) and affect the cost or time of performance shall be the subject of an equitable change in Contract Price or Contract Times.

7.12 *Record Documents*

A. Design-Builder shall maintain the Record Documents in good order, in a safe place at the Site. Design-Builder shall annotate the Record Documents to show all changes and clarifications made (whether in the field or otherwise) during performance of Construction. The Record Documents, as annotated, will be available to Owner for reference. Upon completion of the Construction, Design-Builder shall deliver the Record Documents, as annotated, to Owner.

B. After receipt and review of the Record Documents from Design-Builder upon completion of Construction, the Owner may comment on any possible inaccuracies. After Owner and Design-Builder collaboratively address any such comments, the Record Documents shall be deemed to be Record Drawings and Record Specifications.

C. The Record Drawings and Record Specifications are Contract Documents, and are binding upon Design-Builder with respect to its obligations to comply with the Contract Documents, including but not limited to correction period responsibilities and warranty obligations.

7.13 *Safety and Protection*

A. Design-Builder shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Construction Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Design-Builder shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. All persons on the Site or who may be affected by the Work;

2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

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3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation, or replacement in the course of Construction.

B. Design-Builder shall comply with applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Design-Builder shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Design-Builder shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Design-Builder shall inform Owner of the specific requirements of Design-Builder's safety program with which Owner and its employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.13.A.2 or 7.13.A.3 caused, directly or indirectly, in whole or in part, by Design-Builder, any Construction Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Design-Builder.

F. Design-Builder's duties and responsibilities for safety and for protection of the Construction shall continue until such time as all the Work is completed, Owner has issued a notice to Design-Builder in accordance with Paragraph 14.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion), and Design-Builder has left the Site.

G. Design-Builder's duties and responsibilities for safety and protection shall resume whenever Design-Builder or any Construction Subcontractor, Supplier, or other representative returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Safety Representative*

A. Design-Builder shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.15 *Hazard Communication Programs*

A. Design-Builder shall be responsible for coordinating any exchange of safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Design-Builder is obligated to act to prevent threatened damage, injury or loss. Design-Builder shall give Owner prompt written notice if Design-Builder believes

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that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If a change in the Contract Documents is required because of the action taken by Design-Builder in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.17 *Post-Construction Phase*

A. Design-Builder shall:

1. Provide assistance in connection with the start-up and testing of any equipment or system.

2. Assist Owner in training staff to operate and maintain the Work.

7.18 *Design-Builder's General Warranty and Guarantee*

A. Design-Builder warrants and guarantees to Owner that Design-Builder will perform and complete the Construction as required by the Contract Documents, and that all Construction will be in accordance with the Contract Documents, the Construction Drawings, and the Construction Specifications (as duly modified in accordance with the Contract), and will not be defective.

B. Design-Builder's warranty and guarantee hereunder excludes defects or damage caused by:

1. Abuse, modification or improper maintenance or operation by persons other than Design-Builder, Construction Subcontractors, or Suppliers or any other individual for whom Design-Builder is responsible; or

2. Normal wear and tear under normal usage.

C. None of the following will constitute an acceptance by Owner of Work that is not in accordance with the Contract Documents or a release of Design-Builder's obligation to perform the Work in accordance with the Contract Documents, unless expressly stated otherwise in writing:

1. Observations by Owner;

2. The making of any progress or final payment;

3. The issuance of a certificate of Substantial Completion;

4. Use or occupancy of the Work or any part thereof by Owner;

5. Any review and approval of a Submittal;

6. Any inspection, test, or approval by others; or

7. Any correction of defective Construction by Owner.

7.19 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Design-Builder shall indemnify and hold harmless Owner, Owner's Consultant, and their officers, directors, members, partners, employees, agents, consultants, and subcontractors, from losses, damages, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, damages, or judgment is attributable to

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bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Design-Builder, a Project Design Professional, any Construction Subcontractor, any Supplier, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

B. In any and all claims or actions against Owner, Owner's Consultant, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Design-Builder, a Project Design Professional, any Construction Subcontractor, any Supplier, any individual or entity directly or indirectly employed or retained by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.19.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Design-Builder, a Project Design Professional, or any Construction Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Design-Builder under Paragraph 7.19.A shall not extend to the liability of Owner's Consultant, other consultants or design professionals of Owner, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, designs, or specifications.

ARTICLE 8 – SUBMITTALS

8.01 *Design-Builder's Preparation of Submittals*

A. Design Submittals shall be prepared by Project Design Professionals, on behalf of Design-Builder.

B. The appropriate Project Design Professional shall review and approve each Submittal (including but not limited to all Design Submittals), other than those Submittals not involving technical or engineering matters, before Design-Builder's transmittal of such Submittal to Owner. Such review and approval shall account for the following, as appropriate:

1. That any items covered by such Submittal will, after installation or incorporation in the Construction, comply with the information and requirements in the Contract Documents and the Construction Drawings and Construction Specifications, as duly modified, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, Construction Drawings, and Construction Specifications, as duly modified.

2. That if the Submittal includes any proposed modification of the Contract Documents, Construction Drawings, or Construction Specifications, or any proposed variation from the requirements of such documents, such proposed modification or variation is acceptable based on the standards of the engineering profession (or other applicable design profession), and if implemented will be supported by signing or sealing by a licensed design professional, as necessary.

C. Before Design-Builder's transmittal of a Submittal to Owner, the Design-Builder shall, as applicable:

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1. Review and coordinate the Submittal with other Submittals and with the requirements of the Work, the Contract Documents, the Construction Drawings, and the Construction Specifications, as duly modified;

2. Determine and verify all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal, and confirm that the Submittal is complete with respect to all related data included in the Submittal;

3. Determine and verify the suitability of proposed materials and equipment with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation; and

4. Determine and verify all information relative to Design-Builder's responsibilities for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

D. Design-Builder shall give Owner specific written notice of any proposed modification of the Contract Documents, Construction Drawings, or Construction Specifications, and any variations that a Submittal may have from the requirements of the Contract Documents, Construction Drawings, and Construction Specifications, as duly modified. This notice shall be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Submittal in drawing form, by a specific notation made on the drawing itself.

E. Each Submittal shall bear a stamp or specific written certification by Design-Builder that it has satisfied its obligations under the Contract Documents with respect to preparation of the Submittal, and that Design-Builder approves the Submittal.

F. All Submittals must be acceptable based on compliance with form and content requirements of the Contract Documents. Design-Builder shall submit Design Submittals for Owner's review and approval. Other Submittals shall not require express approval, except as indicated in the Supplementary Conditions or elsewhere in the Contract Documents.

8.02 *Owner's Review of Submittals*

A. Owner will review all Submittals, and may comment on any Submittal. Any response to a Submittal by Owner shall be in accordance with the schedule of required Submittals accepted by Owner as required by Paragraph 2.07, and the provisions of the Contract Documents.

B. For those Submittals requiring Owner's review and approval, Owner's response will be in writing and will indicate either that Owner approves the Submittal or rejects the Submittal. Owner may also include comments regarding the approved or rejected Submittal. For those Submittals that do not require approval, the Submittal shall be deemed acceptable to Owner unless Owner responds with a timely objection or adverse comment.

C. Unless a specific provision of the Contract Documents expressly provides otherwise, Owner's review of a Submittal will be to determine if the Submittal complies with and is consistent with the Contract Documents. If Owner concludes that a Submittal requiring approval complies with and is consistent with the Contract Documents, the Owner shall approve such Submittal.

D. Owner's approval, rejection, or acceptance of a Submittal will not extend to the means, methods, techniques, sequences, or procedures of Construction, or to safety precautions or programs incident thereto.

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E. Owner's review, comments, approval, rejection, or acceptance of Submittals shall not relieve Design-Builder from responsibility for (1) performance of the Work in accordance with the Contract Documents, (2) the scheduling and progress of the Work, (3) the means, methods, sequences, techniques, and procedures of Construction, and safety precautions and programs incident thereto, or (4) any variation from the requirements of the Contract Documents, unless Design-Builder has in a separate written communication at the time of submission called Owner's attention to each such variation, and Owner has given written approval of each such variation; nor shall Owner's review, comments, approval, rejection, or acceptance of a Submittal impose any such responsibility on Owner.

F. Construction tasks and expenditures by Design-Builder prior to Owner's review and approval or acceptance of any Submittal will be at the sole risk of Design-Builder.

G. In reviewing, approving, rejecting, accepting, or commenting on any Design Submittal, Owner does not assume responsibility for the design, for any deficiencies in the Design Submittal or in the Design Professional Services by which they were prepared, or for constructability, cost, or schedule problems that may arise in connection with the Design Submittal.

H. The parties acknowledge that Design-Builder's design responsibilities continue after commencement of Construction. During the course of Construction, the Design-Builder may propose modifications to the Construction Drawings and Construction Specifications. Owner shall approve such proposed modifications if (1) they comply with and are consistent with the Contract Documents, (2) Design-Builder has demonstrated that the modification is minor in character, or will not be detrimental to the quality and function of the Work, (3) the appropriate Project Design Professional has reviewed and approved the proposed modification with respect to any technical or engineering matters, and (4) Owner has not relied on the previously-approved Construction Drawings and Construction Specifications, such that the proposed modification would be detrimental to the Owner's interests. At its option, Owner may also approve more substantial or divergent proposed modifications, provided that the appropriate Project Design Professional has reviewed and approved the proposed modification with respect to any technical or engineering matters.

ARTICLE 9 – OTHER CONSTRUCTION

9.01 *Other Work*

A. In addition to and apart from the Work to be performed and furnished by Design-Builder under the Contract Documents, the Owner may perform other construction work at or adjacent to the Site during the course of the Project. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Design-Builder written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work at or adjacent to the Site, Owner shall provide such information to Design-Builder.

C. Design-Builder shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and to Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for

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the introduction and storage of materials and equipment and the execution of such other work. Design-Builder shall do all cutting, fitting, and patching of the Construction that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Design-Builder shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Design-Builder may cut or alter others' work with the written consent of Owner and the others whose work will be affected.

D. If the proper execution or results of any part of the Construction depends upon work performed by others under this Article 9, Design-Builder shall inspect such other work and promptly report to Owner in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of the Construction. Design-Builder's failure to so report will constitute an acceptance of such other work as fit and proper for integration with the Construction, except for latent defects and deficiencies in such other work.

9.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Design-Builder prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

B. If the Supplementary Conditions do not identify the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors, Owner shall have sole authority and responsibility for such coordination.

9.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Construction or to the property of Design-Builder or the Construction Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Construction, through actions or inaction, then Design-Builder shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Design-Builder in the Contract Documents, and any provisions in Laws or Regulations concerning utility action or inaction, or related remedies. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Design-Builder assigning to Owner all Design-Builder's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Design-Builder's entitlement to an adjustment of the Contract Times is conditioned on such

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adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times.

B. Design-Builder shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Design-Builder fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Design-Builder, and assign to such other contractor or utility owner the Owner's contractual rights against Design-Builder with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Design-Builder shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Design-Builder's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Design-Builder.

D. If Design-Builder damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Design-Builder's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Design-Builder's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Design-Builder or Owner, then Design-Builder shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and its officers, directors, members, partners, employees, agents, consultants and subcontractors from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 10 – OWNER'S RESPONSIBILITIES

10.01 *General*

A. Owner shall do the following in a timely manner so as not to delay the services of Design-Builder:

1. If requested in writing by Design-Builder, furnish reasonable evidence satisfactory to Design-Builder that sufficient funds are available and committed for the entire cost of the Project. Unless such reasonable evidence is furnished, Design-Builder is not required to commence or continue any Work, or may, if such evidence is not presented within a reasonable time, stop Work upon 15 days' notice to the Owner;

2. Make payments to Design-Builder promptly when they are due, as provided in Paragraph 14.01 and 14.06;

3. Furnish the Site as set forth in Paragraph 5.01; arrange for safe access to and make all provisions for Design-Builder to enter upon public and private property as may reasonably be required for Design-Builder to perform Work under the Contract.

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4. Furnish to Design-Builder, as required for performance of the Work, the following, all of which Design-Builder may use and rely upon in performing services under this Agreement:

    a. Environmental assessment and impact statements;

    b. Property, boundary, easement, right-of-way, and other special engineering surveys or data;

    c. Property descriptions;

    d. Zoning, deed, and other land use restrictions;

    e. Utility and topographic mapping and surveys;

    f. Explorations and tests of subsurface conditions at or adjacent to the Site; geotechnical reports and investigations; drawings of physical conditions relating to existing surface or subsurface structures at the Site; any information or data known to Owner concerning underground facilities at the Site; hydrographic surveys, laboratory tests and inspections of samples, materials, and equipment; with appropriate professional interpretation of such information or data;

    g. Any other available information pertinent to the Project including reports and data relative to previous designs, or investigation at or adjacent to the Site;

    h. Engineering surveys to establish reference points which in Owner's judgment are necessary to enable Design-Builder to proceed with the Work;

    i. Assistance to Design-Builder in filing documents required to obtain necessary permits, licenses, and approvals of governmental authorities having jurisdiction over the Project; and

    j. Permits, licenses, and approvals of government authorities that the Contract Documents expressly require Owner to obtain.

5. Provide information known to Owner relating to the presence of materials and substances at the Site that could create a Hazardous Environmental Condition.

B. If an obligation ascribed to Owner in Paragraph 10.01.A is expressly assigned to Design-Builder, in the description of the Work or elsewhere in the Contract Documents, then such express assignment to Design-Builder shall supersede the provision in Paragraph 10.01.A.

C. Recognizing and acknowledging that Design-Builder's services and expertise do not include the following services, Owner shall furnish or obtain, as required for the Project:

    a. Accounting, bond and financial advisory (including, if applicable, "municipal advisor" services as described in Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) and the municipal advisor registration rules issued by the Securities and Exchange Commission), independent cost estimating, and insurance counseling services.

    b. Legal services with regard to issues pertaining to the Project as Owner requires, or Design-Builder reasonably requests.

    c. Such auditing services as Owner requires to review cost submittals or ascertain how or for what purpose Design-Builder has used the money paid.

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D. Examine all studies, reports, alternate solutions, sketches, drawings, specifications, proposals, Submittals (including Design Submittals), and other documents presented by Design-Builder (including obtaining advice of an attorney, insurance counselor, and other consultants as Owner deems appropriate with respect to such examination), and if a decision is required with respect to any such document, render such decision in writing pursuant to any specific schedule, or if no specific schedule pertains, within a reasonable time after receipt of the document.

10.02 *Insurance*

A. Owner's responsibilities with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

10.03 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Design-Builder's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Design-Builder to comply with Laws or Regulations applicable to the furnishing or performance of the Work. Owner will not be responsible for Design-Builder's failure to perform the Work in accordance with the Contract Documents.

10.04 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility with respect to undisclosed Hazardous Environmental Conditions uncovered or revealed at the Site is set forth in Paragraph 5.06.

10.05 *Owner's Site Representative*

A. Owner may furnish an Owner's Site Representative to observe the performance of Construction. The duties, responsibilities and limitations of authority of any such Owner's Site Representative and assistants will be as provided in the Supplementary Conditions.

10.06 *Owner's Consultants and Managers*

A. Owner's Consultant, if any, is identified in the Agreement.

B. Owner shall advise Design-Builder of the identity and scope of services of any other independent consultants or managers retained by Owner to perform or furnish services in regard to the Project, including, but not limited to, cost estimating, project peer review, value engineering, constructability review, program management, project management, or contract administration.

C. Neither Owner's Consultant, Owner's Site Representative, nor any other consultant or manager retained by Owner, has any duties, responsibilities, or authorities with respect to Design-Builder, unless expressly provided in this Contract. Owner's Consultant and such other consultants and managers shall not supervise, direct, or have control or authority over, nor be responsible for, Design-Builder's means, methods, techniques, sequences, or procedures of construction or the safety precautions and programs incident thereto, or for any failure of Design-Builder to comply with Laws or Regulations applicable to the furnishing or performance of the Work; and will not be responsible for Design-Builder's failure to perform the Work in accordance with the Contract Documents.

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10.07 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Design-Builder's safety programs of which Owner has been informed pursuant to Paragraph 7.13.D.

B. Owner shall inform Design-Builder of any specific requirements of safety or security programs that are applicable to Design-Builder while at the Site.

10.08 *Permits and Approvals*

A. Owner shall obtain reviews, approvals, certificates, and permits from governmental authorities having jurisdiction over the Project as indicated in the Contract Documents.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended or supplemented by a Change Order or a Work Change Directive.

1. *Change Orders:* If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.

2. *Work Change Directives*: The Work modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order. When a Work Change Directive is issued, the parties will promptly meet to attempt to negotiate the Work Change Directive's effect, if any, on the Contract Times and Contract Price. The effect, if any, on Contract Times and Contract Price, together with the Work Change Directive's addition, deletion, or revision to the Work, will be set forth in a subsequently issued Change Order.

B. Either Owner or Design-Builder may propose or request a Change Order. With respect to certain events, this Contract may indicate specific times in which such requests or proposals must be submitted to the other party. With respect to all other events, the request or proposal shall be submitted to the other party within 30 days of the event giving rise to the request or proposal.

11.02 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, and notwithstanding any other provision of the Contract, Owner may, at any time or from time to time, order or authorize additions, deletions, or revisions in the Work within the general scope of the Contract. Such changes may be accomplished by a Change Order, if Owner and Design-Builder have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Design-Builder shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Design-Builder to undertake work that Design-Builder reasonably

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concludes cannot be performed in a manner consistent with Design-Builder's safety or professional obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

A. Design-Builder shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any Work performed that is not required by the Contract Documents, as duly amended, except in the case of an emergency as provided in Paragraph 7.16, or in the case of uncovering Construction as provided in Paragraph 13.03.A.3.

11.04 *Changes Involving the Design*

A. To the extent a change, whether proposed by Design-Builder or Owner, ordered by Owner, or set forth in a proposed Change Order or in a Work Change Directive, involves the design (as set forth in the Construction Drawings, Construction Specifications, or otherwise) or other engineering or technical matters, such changes must be reviewed and approved by the applicable Project Design Professional. The review and approval may occur at the time the change occurs, or as part of Design-Builder's provision of Professional Design Services in response to the change.

11.05 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim regarding an adjustment in the Contract Price shall be presented by written notice to the other party in accordance with Paragraph 16.01.

B. If the Contract Price is based on Cost of the Work, then the provisions in the Agreement regarding Cost of the Work and changes in the Design-Builder's fee, Contract Price, Guaranteed Maximum Price, and Guaranteed Maximum Fee, apply.

C. The value of any Work covered by a Change Order or of any adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 12.02); or

2. Where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.05.D); or

3. Where the Work involved is not covered by unit prices contained in the Contract Documents, and agreement to a lump sum is not reached under Paragraph 11.05.C.2, then on the basis of the Cost of the Work for price adjustments (determined as provided in the Cost of the Work provisions in the Agreement, if applicable, or in Paragraph 12.01), plus a Design-Builder's Fee for overhead and profit (determined as provided in Paragraph 11.05.D).

D. *Design-Builder's Fee:* The Design-Builder's fee for overhead and profit on Change Orders shall be determined as follows:

1. A mutually acceptable fixed fee; or

2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

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a. For costs incurred under Paragraphs 12.01.B.1.a. and 12.01.B.2, the Design-Builder's fee shall be 15 percent;

b. For costs incurred under Paragraph 12.01.B.3, 12.01.B.4, 12.01.B.5, and 12.01.B.6, the Design-Builder's fee shall be 5 percent;

c. With respect to Construction Subcontracts, where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of this Contract is that the Design-Builder's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraph 12.01 by the subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Design-Builder itself, and to any Construction Subcontractors of a tier higher than that of the Construction Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Construction Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Construction Subcontractor that actually performs the Work;

d. With respect to Design Agreements, the Engineer or other invoicing Project Design Professional under a Design Agreement may add a fee of 5 percent to an invoice from a lower tier design entity , and Design-Builder may add a fee of 5 percent to an invoice from Engineer or other invoicing Project Design Professional; Owner shall not be responsible for any other mark-up at any tier (other than those incorporated in a factor, multiplier, hourly rate, or stipulated sum from the entity performing the subject Design Professional Services);

e. No fee will be payable on the basis of costs itemized in Paragraph 12.01.B.7 or 12.01.C;

f. The amount of credit to be allowed by Design-Builder to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Design-Builder's fee by an amount equal to 5 percent of such net decrease; and

g. When both additions and credits are involved in any one change, the adjustment in Design-Builder's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.05.D.2.a through 11.05.D.2.e., inclusive.

11.06 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim regarding an adjustment of the Contract Times shall be presented by written notice to the other party pursuant to Paragraph 16.01.

B. Design-Builder's entitlement to an adjustment of the Contract Times under this Contract is conditioned on such adjustment being essential to Design-Builder's ability to complete the Work within the Contract Times.

11.07 *Execution of Change Orders*

A. Owner and Design-Builder shall execute appropriate Change Orders covering:

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1. Changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in Contract Price resulting from an Owner set-off, unless Design-Builder has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's correction of defective Work under Paragraph 13.05 or Owner's acceptance of defective Work under Paragraph 13.07, or (c) agreed to by the parties (all subject to the need for review and approval by the applicable Project Design Professional pursuant to Paragraph 11.04); and

4. Changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Article 16.

B. If Owner or Design-Builder refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notice to Sureties*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be Design-Builder's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – COST OF THE WORK ADJUSTMENTS; UNIT PRICE WORK

12.01 *Cost of the Work*

A. *Costs of the Work Adjustment:* When the price of Work covered by a Change Order or an adjustment in Contract Price is to be determined on the basis of Cost of the Work, the Cost of the Work adjustment means the sum of all costs necessarily incurred and paid by Design-Builder in the proper performance of the specific portion of the Work. The costs to be reimbursed to Design-Builder will be only those additional or incremental costs required because of the change of the Work or because of the event giving rise to the adjustment. If the Agreement contains Cost of the Work provisions, such provisions shall govern in determining the Cost of the Work for Change Order or adjustment purposes. If the Agreement does not contain Cost of the Work provisions, then the provisions in Paragraph 12.01 shall apply.

B. *Costs Included:* The Cost of the Work adjustment does not include any of the costs itemized in Paragraph 12.01.C, and shall include only the following items with respect to the subject Work:

1. Payroll costs for employees in the direct employ of Design-Builder in the performance of the subject Work, under schedules of job classifications agreed upon by Owner and Design-Builder in advance of such performance.

a. Such employees shall include without limitation superintendents, foremen, and other personnel employed full-time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the

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subject Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation, and holiday pay applicable thereto. The expenses of performing the subject Work outside the hours or days permitted by this Contract shall be included in the above to the extent such performance of Work is authorized by Owner.

b. Such employees shall also include engineers, engineering technicians, architects, and others providing Design Professional Services as employees of Design-Builder. For purposes of this Paragraph 12.01.B.1.b, Design-Builder shall be entitled to payment for such employees an amount equal to salary costs times a factor, as designated in the Agreement, for services in the performance of the subject Work.

2. Cost of all materials and equipment furnished and incorporated in the subject Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Design-Builder unless Owner deposits funds with Design-Builder with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Design-Builder shall make provisions so that they may be obtained.

3. Cost of permits obtained by Design-Builder.

4. Payments made by Design-Builder to Construction Subcontractors for subject Work performed or furnished by such Construction Subcontractors. If any subcontract provides that the Construction Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Construction Subcontractor's Cost of the Work and fee shall be determined in the same manner as Design-Builder's Cost of the Work and fee.

5. Payments made by Design-Builder for Design Professional Services provided or furnished with respect to the subject Work under a Design Agreement.

6. Costs of special consultants (not including Project Design Professionals), including but not limited to testing laboratories, attorneys, and accountants, retained for services specifically related to the subject Work.

7. Supplemental costs including the following items:

   a. The proportion of necessary transportation, travel, and subsistence expenses of Design-Builder's employees incurred in discharge of duties connected with the Work.

   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the Site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed that remain the property of Design-Builder.

   c. Rentals of all construction or engineering equipment and machinery, and their parts, whether rented from Design-Builder or from others in accordance with rental agreements approved by Owner, and the costs of transportation, loading, unloading, installation, dismantling and removal of such equipment, machinery, and parts. All such costs shall be in accordance with the terms of such rental agreements. The rental

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of any such equipment, machinery, or parts shall cease when its use is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the subject Work, and for which Design-Builder is liable, imposed by Laws or Regulations.

e. Deposits lost for causes other than negligence of Design-Builder, any Construction Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses, damages, and related expenses caused by damage to the subject Work not compensated by insurance or otherwise, sustained by Design-Builder in connection with the furnishing and performance of the Work provided they have resulted from causes other than the negligence of Design-Builder, any Construction Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Design-Builder's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site, as applicable to the subject Work.

h. Minor expenses such as long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. Cost of premiums for all Bonds and insurance Design-Builder is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Design-Builder's officers, executives, principals (of partnerships and sole proprietorships), general managers, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Design-Builder whether at the Site or in Design-Builder's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 12.01.B.1, all of which are to be considered administrative costs covered by the Design-Builder's fee.

2. Expenses of Design-Builder's principal and branch offices other than Design-Builder's office at the Site.

3. Any part of Design-Builder's capital expenses, including interest on Design-Builder's capital employed for the subject Work and charges against Design-Builder for delinquent payments.

4. Costs due to the negligence of Design-Builder, any Construction Subcontractor, Engineer or other Project Design Professionals, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

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5. Other overhead or general expense costs of any kind, and the costs of any item not specifically and expressly included in Paragraph 12.01.B.

D. *Design-Builder's Fee*: When the value of the Work covered by a Change Order is determined on the basis of Cost of the Work, Design-Builder's fee shall be determined as set forth in Paragraph 11.05.D.

E. *Documentation:* Whenever the cost of any Work is to be determined pursuant to Paragraph 12.01.B and 12.01.C, Design-Builder will establish and maintain cost records in accordance with generally accepted accounting practices and submit in a form acceptable to Owner an itemized cost breakdown together with supporting data.

12.02 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all of Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Design-Builder will be made by Owner.

B. If Design-Builder's compensation is based on Cost of the Work, this Contract will not include compensation under unit prices unless expressly stated otherwise.

C. Each unit price will be deemed to include an amount considered by Design-Builder to be adequate to cover Design-Builder's overhead and profit for each separately identified item.

D. Design-Builder or Owner may seek an adjustment in the Contract Price if:

1. The quantity of any item of Unit Price Work performed by Design-Builder differs materially and significantly from the estimated quantity of such item indicated in the Agreement;

2. Such an adjustment would not duplicate, and is coordinated with, any other related adjustments of Contract Price; and

3. Design-Builder has incurred additional expense, or less expense, as a result of the variation in quantity.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE CONSTRUCTION

13.01 *Access to Construction*

A. Owner, Owner's Consultant, Owner's Site Representative, and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Construction at reasonable times for their observation, inspecting, and testing. Design-Builder shall provide them proper and safe conditions for such access and advise them of Design-Builder's Site safety procedures and programs so that they may comply therewith as applicable.

13.02 *Tests, Inspections, and Approvals*

A. Design-Builder shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

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1. By the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
2. By Laws and Regulations, unless the Contract Documents or Laws and Regulations expressly allocate responsibility for a specific inspection or test to Owner;
3. To attain Owner's acceptance of materials or equipment to be incorporated in the Construction;
4. By manufacturers of equipment furnished under the Contract Documents;
5. To meet the requirements of the Construction Drawings and Construction Specifications;
6. For testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Construction; and
7. For acceptance of materials, mix designs, or equipment submitted for approval prior to Design-Builder's purchase thereof for incorporation in the Construction.

B. Owner shall be responsible for arranging, obtaining, and paying for all inspections and tests expressly required by the Contract Documents or Laws and Regulations to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Construction shall be governed by the provisions of Paragraph 13.03.

C. All inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Design-Builder.

D. If the Contract Documents require the Construction (or part thereof) to be approved by Owner or another designated individual or entity, then Design-Builder shall assume full responsibility for arranging and obtaining such approvals.

E. Design-Builder shall give Owner reasonable notice of the planned schedule for all required inspections, tests, and approvals.

F. Design-Builder shall give Owner timely notice of readiness of the Construction (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

G. Each party shall provide the other with copies of any certificates of inspection or approval obtained with respect to tests and inspections.

H. Both parties may rely on the results of inspections and tests, performed pursuant to this paragraph and the governing provisions of the Contract Documents, Laws and Regulations, and the Construction Drawings and Construction Specifications.

I. If any Construction (or the construction work of others) that is required to be inspected, tested, or approved is covered by Design-Builder without written concurrence of Owner, then Contractor shall, if requested by Owner, uncover such Construction for observation. Such uncovering shall be at Design-Builder's expense unless Design-Builder has given Owner timely notice of Design-Builder's intention to cover the same and Owner has not acted with reasonable promptness in response to such notice.

13.03 *Uncovering Construction*

A. If Owner considers it necessary or advisable that covered Construction be observed by Owner or inspected or tested by others, then Design-Builder, at Owner's request, shall uncover, expose or otherwise make available for observation, inspection, or testing, as Owner may

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require, that portion of the Construction in question, furnishing all necessary labor, material, and equipment.

1. If the Construction had been covered contrary to the written request of Owner or a requirement of the Contract Documents, then uncovering it for Owner's observation and re-covering it shall be at Design-Builder's expense, regardless of whether it is defective.

2. If it is found that the covered Construction is defective, Design-Builder shall pay all costs and damages caused by or resulting from such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement, re-covering, or reconstruction (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price.

3. If the covered Construction is not found to be defective, Design-Builder shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, re-covering, and reconstruction, subject to the provisions of Paragraph 13.03.A.1.

13.04 *Defective Construction*

A. It is Design-Builder's obligation to assure that the Construction is not defective.

B. Owner shall give Design-Builder prompt written notice of all defective Construction of which Owner has actual knowledge. Owner may reject, accept, or correct defective Construction.

C. Promptly after receipt of written notice of defective Construction, unless Owner expressly indicates that it will accept the defective Construction, Design-Builder shall correct all such defective Construction, whether or not fabricated, installed, or completed; or, if Owner has rejected the defective Construction, remove it from the Project and replace it with Construction that is not defective.

D. When correcting defective Construction, Design-Builder shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Construction.

13.05 *Owner May Correct Defective Construction*

A. If Design-Builder fails within a reasonable time after written notice from Owner to correct defective Construction or to remove and replace rejected Construction, or if Design-Builder fails to perform the Construction in accordance with the Contract Documents, or if Design-Builder fails to comply with any other provision of the Contract Documents, Owner may, after 7 days' written notice to Design-Builder, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.05 Owner shall proceed expeditiously. In connection with such corrective and remedial action, Owner may exclude Design-Builder from all or part of the Site, take possession of all or part of the Construction, and suspend Design-Builder's services related thereto, and incorporate in the Construction all materials and equipment stored at the Site or for which Owner has paid Design-Builder but which are stored elsewhere. Design-Builder shall allow Owner, Owner's Consultant, Owner's Site Representative, and Owner's other representatives, agents, employees, and contractors, access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

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13.06 *Costs*

A. Design-Builder shall bear all costs arising out of or relating to the correction, removal, or replacement of defective Construction, including but not limited to repair of adjacent Work or property; delay costs and impacts; fees and charges of engineers, architects, attorneys, and other professionals; and all court, arbitration, or other dispute resolution costs.

B. All costs, losses, and damages (included but not limited to fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others) incurred or sustained by Owner in exercising its rights and remedies arising from defective Construction under this Article will be charged against Design-Builder, by set-off against payment or otherwise.

C. Design-Builder shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to defective Construction.

13.07 *Owner's Acceptance of Defective Construction*

A. If, instead of requiring correction or removal and replacement of defective Construction, Owner prefers to accept it, Owner may do so. If such acceptance is proposed prior to final payment, it shall be subject to confirmation by the applicable Project Design Professional that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety. Design-Builder shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Construction. If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents, and Owner shall be entitled to an appropriate decrease in the Contract Price reflecting the diminished value of the Construction so accepted.

13.08 *Owner May Stop Construction*

A. If Construction is defective, or Design-Builder fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform Construction in such a way that the completed Construction will conform to the Contract Documents, Owner may order Design-Builder to stop Construction or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop Construction will not give rise to any duty on the part of Owner to exercise this right for the benefit of Design-Builder or any other party.

ARTICLE 14 – PAYMENTS TO DESIGN-BUILDER; COMPLETION

14.01 *Progress Payments*

A. *Basis for Progress Payments:* The Schedule of Values established as provided in Paragraph 2.04 will serve as the basis for progress payments. Progress payments on account of Unit Price Work will be based on the number of units completed.

B. *Application for Progress Payment:* On or about the date established in the Agreement for submission of each application for progress payment (but not more often than once a month), Design-Builder shall submit to Owner for review an Application for Payment filled out and signed by Design-Builder covering the Work completed as of the date indicated on the

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Application and accompanied by supporting documentation as required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect Owner's interest therein, all of which will be satisfactory to Owner.

C. *Payment of Obligations:*

1. Beginning with the second Application for Payment, each Application shall include an affidavit of Design-Builder stating that all previous progress payments received on account of the Work have been applied on account to discharge Design-Builder's legitimate obligations associated with prior Applications for Payment.

2. If Design-Builder contends that it has withheld payment of underlying obligations for good cause, then Design-Builder shall inform Owner of the identity of the entity from which Design-Builder has withheld payment, the amount of the withholding, and the reason for the withholding.

D. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

E. *Review of Applications:*

1. Owner will, within 10 days of receipt of each Application for Payment, either indicate in writing its acceptance of the Application and state that the Application is being processed for payment, or return the Application to Design-Builder indicating in writing its reasons for refusing to accept the Application.

F. Not more than 10 days after accepting such Application the amount will become due and when due will be paid by Owner to Design-Builder.

1. If Owner should fail to pay Design-Builder at the time the payment of any amount becomes due, then Design-Builder may, at any time thereafter, upon serving written notice that he will stop the Work within 7 days after receipt of the notice by Owner, and after such 7-day period, stop the Work until payment of the amount owing has been received. Written notice shall be deemed to have been duly served if sent by certified mail to the last known business address of Owner.

2. Payments due but unpaid shall bear interest at the rate specified in the Agreement.

3. No Progress Payment nor any partial or entire use or occupancy of the Project by Owner shall constitute an acceptance of any Work not in accordance with the Contract Documents.

G. *Reduction in or Refusal to Make Payment:*

1. Owner may impose a set-off against the whole or any part of any such payment, or nullify any previous payment because of subsequently discovered evidence or the results of subsequent inspections or tests, to the extent that is reasonably necessary to protect Owner from loss because:

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a. Claims have been made against Owner on account of Design-Builder's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Design-Builder's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from breach of warranty, workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Design-Builder has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Design-Builder has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Design-Builder is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Construction is defective, requiring correction or replacement;

g. Owner has been required to correct defective Construction in accordance with Paragraph 13.05, or has accepted defective Construction pursuant to Paragraph 13.07;

h. The Contract Price has been reduced by Change Orders;

i. An event that would constitute a default by Design-Builder and therefore justify a termination for cause has occurred;

j. Liquidated damages, special damages, or performance damages have accrued under the Contract Documents as a result of Design-Builder's failure to achieve Milestones, Substantial Completion, final completion of the Work, or performance requirements, as applicable;

k. Liens have been filed in connection with the Work, except where Design-Builder has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such liens; or

l. There are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, Owner will give Design-Builder immediate written notice stating the reasons for such action and the specific amount of the reduction, and promptly pay Design-Builder any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Design-Builder the amount so withheld, or any adjustment thereto agreed to by Owner and Design-Builder, if Design-Builder remedies the reasons for such action. The reduction imposed shall be binding on Design-Builder unless it duly presents a written notice of Claim contesting the reduction.

14.02 *Design-Builder's Warranty of Title*

A. Design-Builder warrants and guarantees that title to all Construction, materials, and equipment covered by any Application for Payment, whether already incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

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14.03 *Substantial Completion*

A. When Design-Builder considers the Work ready for its intended use Design-Builder shall notify Owner in writing that the Work is substantially complete (except for items specifically listed by Design-Builder as incomplete) and request that Owner issue a certificate of Substantial Completion. Promptly thereafter, Owner and Design-Builder shall make an inspection of the Work to determine the status of completion. If Owner does not consider the Work substantially complete, Owner will notify Design-Builder in writing giving the reasons therefor.

B. If Owner considers the Work substantially complete:

1. Owner and Design-Builder will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Design-Builder agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

2. Owner will prepare and deliver to Design-Builder a certificate of Substantial Completion which shall fix the date of Substantial Completion. Owner shall attach to the certificate a punch list of items to be completed or corrected before final payment.

C. After Substantial Completion the Design-Builder shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Design-Builder may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

D. Owner shall have the right to exclude Design-Builder from the Site after the date of Substantial Completion subject to allowing Design-Builder reasonable access to remove its property and complete or correct items on the punch list.

14.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Construction which (1) has specifically been identified in the Contract Documents, or (2) Owner and Design-Builder agree constitute a separately functioning and usable part of the Construction that can be used by Owner for its intended purpose without significant interference with Design-Builder's performance of the remainder of the Construction, subject to the following:

1. Owner at any time may request Design-Builder in writing to permit Owner to use or occupy any such part of the Construction that Owner believes to be ready for its intended use and substantially complete. If Design-Builder agrees that such part of the Work is substantially complete, Design-Builder and Owner will follow the procedures of Paragraph 14.03 for that part of the Construction.

2. Design-Builder at any time may notify Owner in writing that Design-Builder considers any such part of the Work ready for its intended use and substantially complete and request Owner to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner and Design-Builder shall make an inspection of that part of the Work to determine its status of completion. If Owner

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does not consider that part of the Work to be substantially complete, Owner will notify Design-Builder in writing giving the reasons therefor. If Owner considers that part of the Work to be substantially complete, the provisions of Paragraph 14.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy of part of the Construction will be accomplished prior to compliance with the requirements of Paragraph 6.05 regarding property insurance.

14.05 *Final Inspection*

A. Upon written notice from Design-Builder that the entire Work or an agreed portion thereof is complete, Owner will make a final inspection with Design-Builder and will notify Design-Builder in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Design-Builder shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.06 *Final Payment*

A. *Application for Payment:*

1. After Design-Builder has completed all such corrections to the satisfaction of Owner and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance, certificates of inspection, and Record Documents, Design-Builder may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (unless previously delivered) by:

a. All documentation called for in the Contract Documents;

b. Consent of the surety, if any, to final payment;

c. Satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment;

d. A list of all disputes that Design-Builder believes are unsettled; and

e. Complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of such releases or waivers of Liens specified in Paragraph 14.06.A.2, and as approved by Owner, Design-Builder may furnish receipts or releases in full and an affidavit of Design-Builder that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed, and (b) all payrolls, material and equipment bills and other indebtedness connected with the Work for which Owner might in any way be responsible, or which in any way might result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Project Design Professional, Construction Subcontractor, or Supplier fails to furnish such a release or receipt in full, Design-Builder may furnish a Bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Final Payment and Acceptance:* If Owner is satisfied that the Work has been completed and Design-Builder's other obligations under the Contract Documents have been fulfilled, Owner will, within 10 days after receipt of the final Application for Payment, give written notice to

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Design-Builder that the Work is acceptable. Otherwise, Owner will return the Application to Design-Builder, indicating in writing the reasons for refusing to process final payment, in which case Design-Builder shall make the necessary corrections and resubmit the Application.

C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment.

D. *Payment Becomes Due*: The amount will become due and will be paid by Owner to Design-Builder 30 days after the presentation to Owner of the acceptable Application and accompanying documentation, in appropriate form and substance and with Owner's notice of acceptability.

14.07 *Waiver of Claims*

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Design-Builder. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.05, from Design-Builder's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from unresolved disputes or Claims presented by Owner, or from Design-Builder's continuing obligations under the Contract.

B. The acceptance of final payment by Design-Builder will constitute a waiver by Design-Builder of all claims and rights against Owner other than those pending matters that have been duly submitted to dispute resolution under the provisions of Article 16.

14.08 *Correction Period*

A. If within one year after the date of Substantial Completion of the entire Work or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Construction is found to be defective, Design-Builder shall promptly, without cost to Owner and in accordance with Owner's written instructions, (1) correct such defective Construction, or, if it has been rejected by Owner, remove it from the Site and replace it with Construction that is not defective, and (2) satisfactorily correct or remove and replace any damage to other Construction or the work of others resulting therefrom. If Design-Builder does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Construction corrected or the rejected Construction removed and replaced, and all costs, losses, and damages caused by or resulting from such removal and replacement (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals, all court or arbitration or other dispute resolution costs, and all costs of repair or replacement of work of others) will be paid by Design-Builder.

B. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Conceptual Documents.

C. Where defective Construction (and damage to other Construction resulting therefrom) has been corrected, or removed or replaced, under this Paragraph 14.08, the correction period hereunder with respect to such Construction will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

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ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 days by notice in writing to Design-Builder, which will fix the date on which Work will be resumed. Design-Builder shall resume the Work on the date so fixed. Design-Builder shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events justifies termination for cause:

1. Design-Builder's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the progress schedule as duly adjusted).

2. Design-Builder's disregard of Laws or Regulations of any public body having jurisdiction.

3. Design-Builder's violation in any substantial way of provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occurs, Owner may, after giving Design-Builder (and the surety, if any) 7 days' written notice, terminate the services of Design-Builder, take possession of any completed Design Submittals prepared by or for Design-Builder (subject to the limited license and indemnification provisions of Paragraph 3.04), exclude Design-Builder from the Site, take possession of the Work, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Design-Builder but which are stored elsewhere, and finish the Work as Owner may deem expedient. In such case Design-Builder shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all costs, losses and damages sustained by Owner arising out of or resulting from completing the Work (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) such excess will be paid to Design-Builder. If such costs, losses and damages exceed such unpaid balance, Design-Builder shall pay the difference to Owner. Such costs, losses and damages incurred by Owner will be incorporated in a Change Order. When exercising any rights or remedies under this paragraph Owner shall not be required to obtain the lowest price for the Work performed.

C. Notwithstanding Paragraph 15.02.B, Design-Builder's services will not be terminated if Design-Builder begins, within 7 days of receipt of notice of intent to terminate, to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

D. Where Design-Builder's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Design-Builder then existing or which may thereafter accrue. Any retention or payment of moneys due Design-Builder by Owner will not release Design-Builder from liability.

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15.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Design-Builder, Owner may, without cause and without prejudice to any other right or remedy of Owner, elect to terminate the Contract. In such case, Design-Builder shall be paid (without duplication of any items) for:

1. Completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. Expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. Amounts paid in settlement of terminated contracts with Project Design Professionals, Construction Subcontractors, Suppliers and others (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs incurred in connection with such terminated contracts); and

4. Reasonable expenses directly attributable to termination.

B. Design-Builder shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Design-Builder May Stop Work or Terminate*

A. If, through no act or fault of Design-Builder, the Work is suspended for a period of more than 90 days by Owner or under an order of court or other public authority, Owner fails to act on any Application for Payment within 30 days after it is submitted, or Owner fails for 30 days to pay Design-Builder any sum finally determined to be due, then Design-Builder may, upon 7 days' written notice to Owner, and provided Owner does not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.A. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Owner has failed for 30 days to pay Design-Builder any sum finally determined to be due, Design-Builder may upon 7 days' written notice to Owner stop the Work until payment is made of all such amounts due Design-Builder, including interest thereon. The provisions of this paragraph are not intended to preclude Design-Builder from obtaining an increase in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Design-Builder's stopping Work as permitted by this paragraph.

ARTICLE 16 – DISPUTES

16.01 *Methods and Procedures*

A. *Notice of Claim:* If Owner and Design-Builder are not in agreement regarding a proposed or requested Change Order, other proposed adjustment of Contract Price or Contract Times, a Work Change Directive issued by Owner, or any other relief proposed or requested under the Contract, then either party may provide written notice of a Claim to the other party. Such notice of Claim shall be given within 90 days of: the proposal or request for a Change Order; such other proposed adjustment of Contract Price or Contract Times; the issuance of the Work Change Directive; or the proposal or request for other relief under the Contract. The notice

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of Claim shall be given within the 90 days regardless of whether the other party has responded to such proposal, request, or issuance, and regardless of whether discussions or negotiations are in progress; provided, however, that the parties may extend the time to give such notice of Claim by mutual written agreement. The notice of Claim shall include a statement of position, specification of the remedy sought, and supporting documentation.

B. *Response:* Within 30 days of the date of notice of Claim, the receiving party shall respond with a written statement of position and any supporting documentation.

C. *Direct Negotiations:* Owner and Design-Builder agree to directly negotiate all Claims between them in good faith for a period of 60 days from the date of notice of Claim.

D. *Mediation:* If direct negotiations are unsuccessful in resolving a Claim, then Owner and Design-Builder shall submit the unsettled Claim to mediation by a mutually agreeable mediator or mediation service. Owner and Design-Builder agree to participate in the mediation process in good faith. The process shall be conducted on a confidential basis, and shall be completed within 120 days.

1. The fees and expenses, including filing fees, of the mediator and any mediation service shall be shared equally by Owner and Design-Builder.

2. The mediation shall be held in the locality where the Project is located, unless another location is mutually agreed upon by the parties.

3. A settlement (if any) resulting from such mediation will be specifically enforceable under the prevailing law, by any court having jurisdiction.

4. Participation in the mediation process in good faith is a condition precedent to commencing final or binding dispute resolution.

E. If mediation is unsuccessful in resolving a Claim, then within 120 days of the completion of the mediation (1) the parties may mutually agree to a binding dispute resolution process of their choice, or (2) the claimant may give notice to the other that the claimant will seek to have the dispute resolved by a binding dispute resolution method established in this Contract, or if no such method has been established, by a court of competent jurisdiction. Failure by claimant to give such notice in a timely manner shall result in a waiver of the Claim.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice to the other party to this Contract, it will be deemed to have been validly given if delivered to the Authorized Representative of the other party:

1. In person, by a commercial courier service or otherwise; or

2. By registered or certified mail, postage prepaid; or

3. By e-mail, with the words “Formal Notice” or similar in the e-mail’s subject line.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

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17.03 *Cumulative Remedies*

A. Unless expressly stated otherwise in this Contract, the duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, or waiver of, any rights and remedies available to any or all of them which are otherwise imposed or available by:

1. Laws or Regulations; or

2. Any special warranty or guarantee; or

3. Other provisions of the Contract.

B. The provisions of Paragraph 17.03.A will be as effective as if repeated specifically in the Contract in connection with each particular duty, obligation, right and remedy to which they apply.

17.04 *Limitation of Damages*

A. With respect to this Contract and any and all Claims and other matters at issue, Owner shall not be liable to Design-Builder for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Design-Builder on or in connection with any other project or anticipated project.

17.05 *No Waiver*

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

17.06 *Survival of Obligations*

A. All representations, indemnifications, warranties and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Contract.

17.07 *Controlling Law*

A. The Contract Documents will be construed in accordance with the law of the place of the Project.

17.08 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. Requirements for the submittal of information that will enable determination of whether the Contractor's proposed materials, equipment or methods of work are in general conformance to the design concept and in compliance with the Contract Documents.

B. Furnish drawings, specifications, descriptive data, certificates, samples, test results, methods, schedules, manufacturer's installation instructions and other information as indicated.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 99 00 – Reference Forms

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the materials and equipment incorporated into the Work, or the methods of performing the Work shall be as described in the accepted submittals.

B. Verify that all features of all products conform to the specified requirements. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment that are being submitted for review. Extraneous materials shall be crossed out or otherwise obliterated.

C. Coordinate submittals among subcontractors and suppliers. Ensure that there is no conflict with other submittals and notify the Engineer in each case where this submittal may affect the work of another contractor or the Owner, including those submittals complying with unit responsibility requirements specified in applicable technical sections.

D. Coordinate submittals with the Work so that work will not be delayed. Coordinate and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another. No extension of time will be allowed because of failure to properly schedule submittals.

E. Do not proceed with work related to a submittal until the submittal process is complete and the submittal has received a response "No Exceptions Taken" or "Make Corrections Noted."

F. Certify on each submittal document that the Contractor has reviewed the submittal, verified field conditions, and complied with the contract documents.

1. Include a copy of the specification section with addendum updates, all referenced and applicable sections, and each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.

a. Use check marks (✓) to denote full compliance with a paragraph as a whole.

b. If deviations from the specifications are indicated and therefore requested by the Contractor, underline each deviation, and denote by a number in the margin to the right of the identified paragraph.

c. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications.

d. Include a detailed, written justification for each deviation.

2. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

1.04 REVIEW COSTS

A. The Owner's cost for review of submittals for the same proposed materials, equipment or work will be apportioned as follows:

1. The cost of review of the initial submittal and the first revised submittal will be borne by the Owner.

2. The cost to review all additional revised submittals after the first revised submittal will be charged to the Contractor. The cost of review shall include, without limitation, administrative, design and engineering activities directly related to review of submittals.

1.05 SUBMITTAL INDEX

A. Within 30 days of the Notice to proceed, submit a list, by specification section, of all submittals to be submitted.

B. Update and resubmit the submittal index on a monthly basis where additional submittals are identified, or as necessary

1.06 CATEGORIES OF SUBMITTALS

A. General

1. Submittals fall into two general categories;

a. Submittals for review and comment require action by the Engineer.

b. Submittals that are primarily for information only do not require Engineer's approval.

B. Submittals for Review and Comment

1. Transmit submittals for review and comment to the Engineer. The Engineer will review the submittal for compliance with the Contract requirements and will provide written comments regarding acceptability.

C. Submittals for Information Only

1. Where specified, furnish submittals to the Engineer for information only. The Engineer may, at the Engineer's option, review, and comment on any product data.

2. Incomplete or inadequate product data will be returned to the Contractor for resubmittal.

1.07 TRANSMITTAL PROCEDURES

A. General

1. Transmit submittals regarding material and equipment under cover of a Shop Drawing/Transmittal Form See Section 01 99 00.

2. Use a separate form for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required.

3. Identify submittal documents common to more than one piece of equipment with all the appropriate equipment numbers.

4. Make submittals for various items with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.

5. Assign a unique sequential number on the transmittal form accompanying each item submitted.

a. Use the following format for original submittal numbers: "XXX"; where "XXX" is the sequential number assigned by the Contractor.

b. Use the following format for resubmittals: "XXX-Y"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals, i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. Submittal 25B, for example, is the second resubmittal of submittal 25.

B. Electronic Submittals

1. Electronic submittals are preferred except as otherwise indicated.

2. Prepare electronic submittals and Shop Drawings in electronic (*.pdf) format including half-sized and full-sized drawings, catalog information and other required submittal information.

3. Break down submittals that are larger than 10 megabytes into smaller sections, using logical division points to create sections.

4. Electronically bookmark electronic submittals greater than 30 pages in length by major submittal section to facilitate ease of navigation.

C. Paper copy submittals are not an acceptable alternative to electronic submittals except for samples.

D. Deviation from Contract

1. If the Contractor proposes to provide material, equipment, or method of work that deviates from the project manual, so indicate under "Proposed Deviations" on the transmittal form accompanying the submittal copies.

E. Submittal Completeness

1. Submittals that do not have all the information required to be submitted, including deviations, are not acceptable and will be returned without review.

1.08 SUBMITTAL CONTENT

A. Prepare submittals in compliance with individual Specification Sections and as indicated herein.

B. Shop Drawings:

1. Develop project-specific, scaled drawings to fully identify materials and products that will be provided and their relationship to other products that will be furnished and installed.

2. Do not utilize reproductions of the Contract Documents as the basis for the submittal.

3. Identify products, assemblies, equipment, and systems.

4. Provide equipment identification numbers or tag numbers, wiring diagrams, and setting diagrams.

5. Identify critical dimensions.

C. Product Data:

1. Provide information necessary to demonstrate conformance with the specified requirements. Include performance curves, specifications, and wiring diagrams.

2. Product data may consist of manufacturer's standard catalog information and data sheets, marked to indicate the specific products that will be provided.

3. Provide supplemental information as necessary to fully demonstrate how products will be modified from the manufacture's standard products to meet the specification requirements.

D. Manufacturer's Instructions: Written or published information that establishes the manufacturer's recommendations, guidelines and procedures for handling and installation of products, equipment, and assemblies.

E. Samples: Mount, display or package samples in a manner that will facilitate review and establish workmanship and quality of materials.

1.09 SUBMITTAL REQUIREMENTS

A. When the Contract Documents require a submittal, submit the specified information as follows:

1. Submittals for Review and Comment:

a. Electronic Submittal: Submit one electronic (*.pdf) submittal.

2. Submittals for Information Only:

a. Electronic Submittal: Submit one electronic (*.pdf) submittal.

1.10 REVIEW PROCEDURE

A. General

1. The Engineer will review submittals within the processing time identified in paragraph “Processing Time” and return:

a. Electronic Submittal – a signed submittal response document, in (*.pdf) format.

b. Paper Copy Submittal – Two marked up copies of the submitted copies. The reproducible original will be retained by the Engineer.

B. Submittals for Review and Comment

1. The returned submittal will indicate one of the following actions:

a. "NO EXCEPTIONS TAKEN" – The material, equipment or work method complies with the project manual.

b. "MAKE CORRECTIONS NOTED" – Limited corrections are required.

1) Provide a corrected copy where:

a) The information is to be included in the O&M data.

b) If requested by the Engineer.

c. "AMEND AND RESUBMIT" – The submittal is insufficient or contains incorrect data.

d. "REJECTED – SEE REMARKS" – The material, equipment, or work method does not comply with the project manual. Submittals with deviations that have not been identified clearly may be rejected.

2. For submittals marked "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED.

a. The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with any noted corrections.

3. For submittals marked "AMEND AND RESUBMIT" or "REJECTED – SEE REMARKS"

a. Contractor shall provide a typed letter responding to each of the Engineer’s review comments with each resubmittal.

b. Except at its own risk, the Contractor shall not undertake the work covered by such submittals until a new submittal is submitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

C. Submittals for Information Only

1. The returned submittal will indicate ACCEPTED FOR RECORD” if the submittal is complete and adequate.

2. Engineer may return comments on information submittals to identify concerns with what was submitted, in such case, Contractor shall address concerns in writing and return a revised submittal.

1.11 PROCESSING TIME

A. Prepare submittals and transmit to Engineer for review in sufficient time to allow Engineer's review; manufacture, fabrication or assembly of materials and systems; and shipping of material to the site in time for installation in accordance with the Contractor's schedule.

B. Engineer's time for review will begin upon receipt of a complete and comprehensive submittal containing all required information.

C. Engineer will review submitted information and transmit a response to Contractor within 21 days after receipt, subject to the following:

1. In some instances, review times for specific submittals may be modified by the individual specification Section.

2. Resubmittals will be subject to the same review time.

D. No adjustment of Contract Time or Contract Price will be allowed due to delays in the progress of the Work that are caused by rejected submittals and subsequent resubmittals.

1.12 EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS

A. The purpose of submittals is to demonstrate how Contractor intends to conform to the Contract Documents and design concepts. Engineer is entitled to rely upon the accuracy and completeness of designs, calculations, or certifications made by licensed professionals whether or not a stamp or seal is required by the Contract Documents.

B. The review procedure is based on the Contractor's guarantee that all features and characteristics not requiring submittals conform to the contract documents.

C. Review of contract drawings, methods of work, or information regarding materials or equipment the Contractor proposes to provide, does not relieve the Contractor of its responsibility for

1. Fulfilling the requirements of the Contract,

2. Proper operation of the equipment,

3. Correction of defective work

D. Reviews shall not be regarded as an assumption of risk or liability by the Engineer or the Owner.

E. A mark of "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED" means that the Owner has no objection to the Contractor, upon its own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.

F. The Engineer's review of shop drawings, samples, or test procedures will be only for conformance with design concepts and for compliance with information given in Contract Documents. The Engineer's review does not extend to:

1. Accuracy of dimensions, quantities, or performance of equipment and systems designed by Contractor.

2. Contractor's means, methods, techniques, sequences, or procedures except when specified, indicated on the Drawings, or required by Contract Documents.

3. Safety precautions or programs related to safety which shall remain the sole responsibility of the Contractor.

G. Review of a separate item does not indicate approval of the assembly in which the item functions.

1.13 SUBSTITUTIONS OR "OR EQUAL" ITEMS

A. Named or Sole Source Times

1. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required.

2. Unless the name designated a "sole source" and/or is followed by words indicating that no substitution is permitted, materials, or equipment of other Suppliers may be accepted by Engineer. Follow the procedures in the General Conditions.

B. Modification due to Substitutions

1. All costs for redesign required by the implementation of the proposed substitute shall be borne by the Contractor.

2. All costs associated with incorporating a substitution into the project shall be borne by the Contractor.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

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SECTION 05 50 01

ANCHOR BOLTS AND ANCHORING DEVICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Anchor bolts, concrete anchors, adhesive anchors, and other anchoring devices.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals

1.03 SUBMITTALS

A. Comply with Section 01 33 00.

B. Product Data: Manufacturer's data for nuts, bolts, concrete anchors, chemical anchors and other fasteners.

C. Catalog data and ICC reports for each type of anchor bolt.

1.04 QUALITY ASSURANCE

A. For applications that require special inspection in accordance with building codes, coordinate the progress of the Work with the required inspection activities.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Unless otherwise specified or indicated on the Drawings, materials of construction for anchoring devices shall conform to the following:

1. Anchor bolts and other anchoring devices, nuts and washers installed indoors: Type 304 stainless steel.

2. Anchor bolts and other anchoring devices, nuts and washers installed outdoors or in locations exposed to wastewater: Type 316 stainless steel.

a. Locations exposed to wastewater includes:

1) Below tops of walls of water-containing structures.

2) Underside of roof, slab or walkways of enclosed water-containing structures.

3) Dry side of walls on water-containing structures.

2.02 CAST-IN-PLACE ANCHOR BOLTS

A. Locations for use of cast-in-place anchor bolts:

1. In locations indicated on the Drawings.

2. To anchor engine-driven equipment and equipment with motors 3 horsepower and larger.

B. Cast-in-Place Anchor Bolts

1. Material: Stainless steel conforming to ASTM A320.

2. Minimum Length of Bolt: As indicated on the Drawings. When not indicated, provide bolt length such that the length of the embedded anchor is at least 10 bolt diameters.

3. Minimum length of 90-degree hook: 4 bolt diameters.

2.03 CONCRETE ANCHORS

A. Concrete Anchors: Drilled in place wedge-type anchors with threaded stud body, stainless steel expansion clip, nut and washer.

B. Materials: Type 304 or Type 316 stainless steel, depending upon installed location.

C. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC193.

D. Manufacturers: One of the following or equal:

1. Hilti Kwik Bolt 3.

2. ITW Redhead, Trubolt Wedge Anchor.

3. Dewalt Fasteners, Power-Stud SD4 or SD6.

4. Simpson Strong Tie, Strong-Bolt 2 Wedge Anchors.

2.04 STUDS

A. Material: Conforming to ASTM A108 with 50,000 pounds per square inch minimum yield strength, and 60,000 pounds per square inch minimum tensile strength.

B. Manufacturers: One of the following or equal:

1. Nelson Stud Welding Company, S3L Shear Connectors or H4L Concrete Anchors.

2. Stud Welding Products, Headed Concrete Anchors and Shear Connectors or Concrete Anchors.

2.05 ADHESIVE ANCHORS

A. Applications: Use for bonding threaded rods and concrete reinforcing bars to hardened concrete and grouted cement masonry. Do not use in overhead applications, in chlorine gas environments, or where anchor may be exposed to machine oil or diesel oil.

B. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC58.

C. Materials

1. Epoxy Adhesive: Two component, injectable epoxy adhesive.

2. Concrete Reinforcing Bars: Grade 60.

3. Threaded Rods: Type 304 stainless steel all-thread rod conforming to ASTM F593.

D. Manufacturers: One of the following or equal:

1. Hilti HVA Adhesive Anchor System.

2. ITW Redhead G6+ Adhesive Anchoring System.

3. Dewalt Fasteners PE1000+ Epoxy Anchoring System.

4. Simpson Strong Tie, SET-XP Epoxy Adhesive.

PART 3 - EXECUTION

3.01 GENERAL ANCHORING REQUIREMENTS

A. Use equipment shop drawings, anchorage layout drawings, and anchor bolt layout templates to accurately position anchor bolts.

B. Install anchor bolts, concrete anchors and other anchoring devices with at least 2 threads projecting beyond the nut, but no more than 1/2-inch projecting beyond the nut.

C. Prior to installing nuts, coat threads of stainless steel bolts with material to prevent galling of threads.

1. Manufacturers: One of the following or equal:

a. Never Seez Compound Corporation, Never-Seez.

b. Oil Research, Inc., WLR No. 111.

D. Tighten nuts on anchor bolts, concrete anchors and other anchoring devices to the "snug-tight" condition, defined as tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary wrench.

3.02 CAST-IN-PLACE ANCHOR BOLTS

A. Do not use expansion type concrete anchors or adhesive anchors as substitution for cast-in-place anchor bolts.

B. Accurately place anchor bolts to be embedded in concrete within the formwork and perpendicular to surface from which they will project. Secure in correct position while concrete is placed.

C. Do not allow anchor bolts to touch reinforcing steel. Where anchor bolts are within 1/4 inch of reinforcing steel, isolate with a minimum of 4 wraps of 10 mil polyvinyl chloride tape in area adjacent to reinforcing steel.

D. In anchoring machinery bases subject to heavy vibration, use 2 nuts, with 1 serving as a locknut.

E. Where bolts are indicated on the Drawings for future use, first coat thoroughly with non-oxidizing wax, then turn nuts down full depth of thread and neatly wrap exposed thread with waterproof polyvinyl tape.

F. Where indicated on the Drawings, set anchor bolts in metal sleeves having inside diameter approximately 2 inches greater than the bolt diameter and a minimum of 10 bolt diameters deep. Fill sleeves with grout when equipment is grouted in place.

3.03 CONCRETE ANCHORS AND ADHESIVE ANCHORS

A. Cast-in-place anchor bolts may be used in place of concrete anchors and adhesive anchors at Contractor’s option.

B. Installation

1. Drill holes using concrete drill bits and impact type drill motors. Hole diameter shall be in accordance with the manufacturer's recommendations.

2. Clean drilled hole using compressed air to dislodge and remove drilling dust.

3. Accurately locate concrete anchors and set anchors with axis perpendicular to surfaces from which they will project.

4. Do not disturb adhesive anchors until cure time has elapsed.

5. Unless otherwise indicated on the Drawings or as required by structural calculations prepared by the equipment supplier, comply with minimum embedment lengths identified in the following table.

Minimum Embedment Lengths for Concrete and Adhesive Anchors

Diameter of Anchor or Bar, inches	Embedment Length for Concrete Anchors, inches	Embedment Length for Adhesive Anchors or Reinforcing Bars
1/4	1-3/4	As indicated on the Drawings
3/8	1-7/8	
1/2	2-1/4	
5/8	2-3/4	
3/4	3-1/4	
(1) Provide longer embedment where otherwise indicated		

END OF SECTION

SECTION 05 52 00

HANDRAIL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Aluminum handrail.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section:

1. Section 01 33 00 – Submittals

1.03 PERFORMANCE REQUIREMENTS

A. Design railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Aluminum Handrails: The lesser of minimum yield strength divided by 1.65 or minimum ultimate tensile strength divided by 1.95.

B. Structural Performance: Provide railings capable of withstanding the following loads and stresses:

1. Handrails:

a. Uniform load of 50 pounds per lineal foot applied in any direction.

b. Concentrated load of 200 pounds applied in any direction.

c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Top Rails of Guards:

a. Uniform load of 50 pounds per lineal foot applied horizontally and concurrently with 100 pound load applied vertically downward.

b. Concentrated load of 200 pounds applied in any direction.

c. Uniform and concentrated loads need not be assumed to act concurrently.

C. Thermal Movement: Provide exterior railings that allow for thermal movements resulting from a change in surface temperature of 120 degrees.

D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.04 SUBMITTALS

A. Comply with Section 01 33 00.

B. Product Data: Manufacturer's standard catalog data for mechanically connected railings.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

D. Calculations: Structural analyses signed and sealed by the qualified professional engineer, licensed in the State of Oregon, responsible for their preparation.

E. Samples for selection of surface color or texture.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E894 and ASTM E935.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing through one source from a single manufacturer.

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication. Indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: One of the following or equal:

1. Aluminum Pipe and Tube Railings:

a. AlumaGuard Corp.

b. CraneVeyor Corp.

c. Blum, Julius & Co., Inc.

d. Moultrie Manufacturing Company.

2.02 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.03 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

B. Extruded Bars and Tubing: ASTM B221, Alloy 6063-T5/T52.

C. Extruded Structural Pipe and Round Tubing: ASTM B429, Alloy 6063-T6.

1. Provide Standard Weight (Schedule 40) pipe, unless otherwise indicated.

D. Drawn Seamless Tubing: ASTM B210, Alloy 6063-T832.

E. Plate and Sheet: ASTM B209, Alloy 6061-T6.

F. Die and Hand Forgings: ASTM B247, Alloy 6061-T6.

G. Castings: ASTM B26/B26M, Alloy A356.0-T6.

2.04 FASTENERS

A. General: Provide the following:

1. Aluminum Railings: Type 316 stainless-steel fasteners.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Anchors: Provide chemical or expansion-type anchors, fabricated from Type 316 stainless steel with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E488 conducted by a qualified independent testing agency.

2.05 FABRICATION

A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage.

B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

F. Cut, reinforce, drill, and tap to receive finish hardware, screws, and similar items.

G. Connections: Fabricate railings with either welded or nonwelded connections, unless otherwise indicated.

H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove flux immediately.

4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

I. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

K. Form changes in direction by bending or by inserting prefabricated elbow fittings.

L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

M. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

N. For removable railing posts, fabricate slip-fit sockets from stainless steel tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height. Provide socket covers designed and fabricated to resist being dislodged.

1. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

2.06 FINISHES, GENERAL

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Finishes

1. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.

3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.02 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to 1 side, and locate joint within 6 inches of post.

3.03 ANCHORING POSTS

A. For aluminum pipe railings, attach posts using fittings designed and engineered for this purpose.

B. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.04 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work.

END OF SECTION

SECTION 13 34 00

REINFORCED, CAST-IN-PLACE CONCRETE TANK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Design, engineering, calculations, drawings, fabrication, and construction of a new reinforced concrete tank, and includes designing, furnishing, constructing, testing, bonding, cleaning, and permitting.

B. Tank and foundation shall be reinforced concrete, cast-in-place construction with a roof as indicated and specified in this specification section and in the project drawings.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals

1.03 QUALITY ASSURANCE

A. Tank Design-Builder Qualifications

1. All work in connection with design and construction of the tank shall be performed by a competent and experienced Tank Design-Builder who has at least ten years' experience.

2. All work in connection with design, engineering, fabrication, and construction of the tank shall be performed by a competent and experienced Tank Design-Builder with a minimum of ten years' experience.

3. Must have previously constructed a minimum of ten (10) similar tanks of a similar size or larger within the last five years.

4. Hold a current Oregon state contracting license and supply with the bid proof of the license and a list of references of previously constructed tanks.

B. Design Responsibility

1. The Tank Design-Builder shall provide certification, signed by a Oregon Registered Structural Engineer, stating that all members, elements and connections of and to the tank are designed to withstand required loads and forces. Certification shall list the codes and specifications to which structural design conforms. Tank construction drawings and calculations, noted under Submittals of these specifications, shall bear the stamp of a Oregon Registered Structural Engineer.

C. The Tank Design-Builder shall use all new tank materials when manufacturing and constructing the reinforced concrete tank and any of its appurtenances.

D. Construction of the tank is to be by the Tank Design-Builder and must be fully responsible for the entire installation including tank construction, and the ultimate water tightness of the complete installation.

1.04 REFERENCES

A. The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and the listed standards, the requirements of this section shall prevail.

Standard	Title
AASHTO T210	Aggregate Durability Index
ACI 214	Evaluation of Strength Test Results of Concrete
ACI 301	Structural Concrete for Buildings
ACI 304	Measuring, Mixing, Transporting, and Placing Concrete
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 347R	Concrete Formwork
ASTM C31	Making and Curing Concrete Test Specimens in the Field
ASTM C33	Concrete Aggregates
ASTM C39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C42	Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C94	Ready-Mixed Concrete
ASTM C117	Materials Finer Than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C142	Clay Lumps and Friable Particles in Aggregates
ASTM C143	Slump of Portland Cement Concrete
ASTM C150	Portland Cement
ASTM C157	Length Change of Hardened Cement Mortar and Concrete
ASTM C172	Sampling Freshly Mixed Concrete
ASTM C231	Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Air-Entraining Admixtures for Concrete
ASTM C289	Potential Reactivity of Aggregates (Chemical Method)
ASTM C595	Blended Hydraulic Cements
ASTM C618	Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
CRD-C572	Corps of Engineers Specifications for Polyvinylchloride Waterstop
NSF/ANSI 61	Drinking Water System Components – Health Effects

1.05 SUBMITTALS

A. Comply with Section 01 33 00 and submit the following:

1. Complete detailed design and drawings of tank including roof, wall, foundation, concrete mix, reinforcement, anchoring, appurtenances, earthwork, erosion control, and all other required design within the construction limits on the Drawings. Detailed design shall include any other pertinent data concerning the construction of the tank.

2. Structural calculations of the tank, accessory items, tank foundation, and tank anchor bolts shall be prepared and signed by a Structural Engineer currently licensed in the State of Oregon. The name and address of the responsible engineer shall appear on the cover of the submitted calculations. The submittal shall include a description of structural design, loading conditions, seismic anchorage calculations and details, and codes used in establishing the allowable stresses and safety factors.

3. Horizontal and vertical loadings, erection and settlement tolerances.

4. Concrete submittals to be submitted in accordance with the Contract Documents.

5. Hydraulic testing report.

1.06 DESIGN CRITERIA

A. Tank Specifications

1. Refer to project drawings

2. Inside Diameter: 26.0 feet

3. Side Wall Height (top of foundation to top of roof): 25 feet

4. Max WSE: 23.5 feet

5. Design Capacity: 93,318 gallons at max WSE

1.07 WARRANTY

A. The Tank Design-Builder must include a warranty on tank materials and workmanship for a specified period. As a minimum, the warranty must provide assurance against defects in material, coatings and workmanship for a period of five (5) year after Notice of Acceptance has been issued or the tank is placed into service (whichever comes first.

PART 2 - PRODUCTS

2.01 TANK SUPPLIERS

A. Named Manufacturers

1. Baker Silo, Inc.

2. Or Approved Equal

2.02 APPURTENANCES

A. Design tank and accessories to applicable federal, state, and local health and safety requirements including but not limited to OSHA.

B. Top Access Hatch

1. The top access hatch shall be a double leaf 30”x48” aluminum hatch with lift assist and provisions for a padlock, fall blocks and weather stripping installed on the roof.

2. Manufacturers

a. Halliday Products, Inc.

b. Bilco, Inc.

c. Or Approved Equal

C. Grade Level Maintenance Access Hatch

1. Provide a 30”x30” minimum flanged side maintenance access hatch with a self-supporting hinge system.

D. Ladder & Safety Cage

1. Exterior ladder shall be provided per the Drawings and shall comply with current OSHA regulations.

E. Air Vent

1. The air vent shall be 8-inch diameter gooseneck located in the center of the roof with a non-corrosive screen (24 mesh).

2. Air vent design calculations shall be provided.

F. Overflow and Tank Drain

1. The overflow shall be 6-inch diameter in the sidewall as shown in the drawings.

2. The overflow shall include a non-corrodible screen.

3. The overflow shall be provided with a pipe thread at the exterior wall surface.

4. The overflow shall be piped to ground level directed away from the reservoir base.

5. The tank drain shall be 6-inch diameter in the sidewall as shown in the Drawings.

G. Roof Guardrail

1. Provide roof guardrails and toeboard in accordance with Drawings.

PART 3 - EXECUTION

3.01 GENERAL

A. In accordance with requirements set forth by regulatory agencies applicable to the construction industry and in accordance with manufacturer’s instructions, the Tank Design-Builder shall provide and require the use of personal lifesaving equipment for persons working on or about the site. As a minimum, personal lifesaving equipment shall properly address protection of those persons in the following categories:

1. Head and face protection

2. Respiratory devices (for painting)

3. Ventilation

4. Sound levels

5. Lighting

6. Temporary ladders and scaffolding

7. Welding safety practices

B. The Tank Design-Builder shall conduct all operations in a clean and sanitary manner. Special care shall be taken to keep the tank interior free of waste materials.

C. The Tank Design-Builder shall clear the area within the foundation of all leaves, trash, and other debris prior to installation of tank. All cleared materials shall be disposed of in a manner, and in areas, as directed by the Owner.

D. The Tank Design-Builder must field verify the foundation elevation and the tolerances of the in-place foundation. Any deviations must be reported to the Engineer for correction before proceeding with any work. All tank underground piping must be in place prior to the commencement of tank construction.

3.02 SITE PREPARATION & EARTHWORK

A. Complete site preparation and earthwork in accordance with the Contract Documents.

3.03 REINFORCED CONCRETE

A. Complete all concrete work in accordance with the Contract Documents.

B. Sack finish to interior tank shall be in accordance with the Contract Documents.

C. All welding work for the tank appurtenances must be done in accordance with the Contract Documents.

3.04 FIELD QUALITY CONTROL

A. Test cylinders shall be cast for each concrete pour by either the Tank Design-Builder or a certified test lab.

B. All field quality control must be done according to contract documents.

3.05 TANK HYDRAULIC TESTING & CLEANUP

A. Upon completion of all tank, the Tank Design-Builder shall remove all staging, scaffolding, containers, surplus materials and rubbish from the premises in a manner approved by the Owner and shall leave the premised in a clean and orderly condition.

B. Sack finish the walls per Contract Documents.

C. Cleaning and pressure washing.

D. Disposal of abrasive blast residue shall be in a manner consistent with guidelines set forth by the U.S. Environmental Protection Agency (USEPA).

3.06 PERMITS

A. Tank Design-Builder shall be responsible for obtaining building permitting from the City of Sweet Home. Owner will assist in obtaining timely permit reviews and will pay permit fees.

3.07 ACCEPTANCE

A. Acceptance by the Owner of the completed work as herein specified is subject to a guarantee by the Tank Design-Builder against any repairs, leaks or damage caused by defective workmanship or materials furnished by the Tank Design-Builder for a period of 5 (five) year after Notice of Acceptance has been issued.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Earthwork requirements for sitework, structures, roads and general earthwork, including excavation, fill, backfill, grading, and compaction; import of material; and disposal of surplus and unsuitable materials.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 31 10 00 – Site Preparation
3. Section 31 23 16.26 – Rock Excavation
4. Section 31 23 19 – Dewatering
5. Section 31 50 00 – Excavation Support and Protection

1.03 DEFINITIONS

A. Backfill: Earthwork necessary to add fill between new structures and the excavation up to the sub or finish grade.

B. Borrow Area: Area identified from which to obtain earthwork materials.

C. Cut: Earthwork necessary to remove existing material to lower the existing grade in elevation to sub or finish grade.

D. Embankment: Materials placed to form the subgrade for roadways or site improvements.

E. Excavation: Earthwork necessary to remove existing material for the installation of structures.

F. Fill: Earthwork necessary to add material to bring the existing grade up in elevation to sub or finish grade.

G. Finish Grade: Final surface following placement of surfacing, if any, as indicated.

H. Subgrade: The surface of the earthwork on which pavement, surfacing, base, subbase, or a layer of any other material is placed.

1.04 SUBMITTALS

A. Prepare submittals and submit in accordance with Section 01 33 00.

B. For imported materials, provide certification and source.

C. For excavations 5 feet or deeper: Submit detailed plan of all shoring, bracing, side sloping, or other provisions for worker protection against the hazard of caving ground during excavations in accordance with Section 31 50 00.

1.05 QUALITY ASSURANCE

A. Materials and Compaction Testing.

1. Source testing of materials: Provided and paid for by Contractor.

2. Field testing of compaction: Provided and paid for by Owner.

B. Compaction Testing Standards

1. In-place Density of Compacted Fill Material: Density determined in the field in accordance with ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

2. Maximum Dry Density of Compacted Material: determined in the laboratory in accordance with Method C of ASTM D1557-12e1 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

C. Material Testing Standards:

1. Particle size analysis of soils and aggregates: ASTM D6913 – Standard Test Methods for Particle-Size Distribution of Soils Using Sieve Analysis. ASTM D7928– Standard Test Method for Particle-Size Distribution of Fine-Grained Soils Using the Sedimentation Analysis.

2. Determination of sand equivalent value: ASTM D2419 – Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

3. Liquid limit, plastic limit, and plasticity index: ASTM D4318 – Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

4. The testing for organic matter: ASTM D2974 – Standard Test methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.

D. References in this section to soil classification types and standards shall have the meanings and definitions indicated in ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes. Contractor shall be bound by all applicable provisions of ASTM D2487 in the interpretation of soil classifications.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General fill, backfill, and embankment materials:

1. Selected or processed clean earth, rock, or sand, free from grass, roots, brush, other vegetation, corrosive and hazardous materials, manmade objects, and debris.

2. Materials not defined as unsuitable as indicated below, except some materials listed as unsuitable may be used, if indicated on the Drawings or when acceptable to the Engineer, when thoroughly mixed with suitable materials to form a stable composite.

3. Obtain suitable materials from one or more of the following:

4. Onsite excavations and designated borrow areas.

5. Processed on-site materials.

6. Onsite soils are not suitable for use as structural fill.

7. Imported from offsite borrow areas and processing plants.

8. If imported materials are required by this Section, or to meet the quantity requirements of the Project, provide the imported materials at no additional expense to Owner, unless a unit price item is included for imported materials in the Bidding Schedule.

9. Large rocky material: When embankment material consists of large rocky material, or hard lumps, such as hardpan or cemented gravel which cannot be broken down readily, distribute such material evenly throughout the embankment. Place sufficient earth or other fine material around the larger material as it is deposited so as to fill the interstices and produce a dense, compact embankment. Do not place rocks larger than 6 inches in diameter within the upper 2 feet of the embankment subgrade.

10. Further condition fill, backfill, and embedment materials as described below or as indicated on the Drawings.

B. Structural Fill

1. 1.5 inch or ¾ inch minus Dense Graded Aggregates as Defined in Section 02630-10 of the Oregon Standard Specifications for Construction

C. Structure Backfill Material

1. Open Graded Aggregate as defined in Section 2630.11 of the Oregon State Standard Specifications for Construction

D. Subgrade Stabilization material

1. Well graded granular material

2. Maximum size of 4 inches

3. Less than 5 percent passing the No. 4 Sieve

4. Free of organic material

E. Reinforcement Geotextile:

1. Permeable, woven

2. Polypropylene, polyester or a combination of both

3. Meeting requirements of Type 2 Woven Riprap Geotextile, as defined in Table 02320-2 of the Oregon State Standard Specification for Construction

4. Approved manufacturers

a. TenCate Mirafi, RS 380i

F. Sand:

1. Clean, coarse, natural sand free from organic material, suitable for the purpose intended.

2. Gradation: 90 percent to 100 percent will pass a No. 4 sieve and not more than 5 percent will pass a No. 200 sieve.

2.02 UNSUITABLE MATERIALS

A. Unsuitable materials include the materials listed below:

1. Soils which, when classified under ASTM D2487, fall in the classifications of Pt, OH, CH, MH, or OL, or in a classification that contains Pt, OH, CH, MH, or OL in combination with any other letter designation, such as CH/CL.

2. Soils which cannot be compacted sufficiently to achieve the density specified for the intended use, or are unstable or pump regardless of the degree of compaction.

3. Materials that contain hazardous or designated waste materials including petroleum hydrocarbons, pesticides, heavy metals, and any material which may be classified as hazardous or toxic according to applicable regulations.

4. Soils that contain greater concentrations of chloride or sulfate ions, or have a soil resistivity or pH less than the average values for existing onsite soils.

5. Topsoil, sludge and sludge-entrained soils.

6. Rocks, stones, and boulders larger than 6-inches in diameter.

7. Onsite soils are not suitable for use as structural fill.

2.03 SOURCE QUALITY CONTROL

A. Materials source testing will be performed by a testing laboratory by a third-party special inspections and testing firm retained by the Owner.

B. Minimum Frequency of sampling:

1. Fill, backfill and embankment material generated from earthwork activities:

2. Two soil samples every 500 cubic yard of material used.

3. Two soil samples whenever the character of the soil changes.

4. One soil sample when directed by the Engineer.

5. Obtain samples that represent the predominate character of the soil that is encountered.

6. Sampling of Imported Material

7. Obtain representative samples of product from supplier.

8. After initial testing demonstrated that the proposed borrow material meets the specified requirements, obtain and test one additional sample for every 500 cubic yard of imported material.

C. Testing:

1. Test all materials used in the Work to confirm they meet the requirements indicated.

2. Prepare moisture-density curves for use in determining the optimum moisture content and in-place density of the compacted backfill.

PART 3 - EXECUTION

3.01 EXCAVATION – GENERAL

A. Excavation includes the removal of all materials of whatever nature encountered, including all obstructions of any nature.

B. Excavation shall conform to the lines and grades indicated on the Drawings.

C. Clear, grub and strip and remove topsoil in construction and borrow areas in accordance with Section 31 10 00.

D. Excavation Stability

1. Slope excavated faces or otherwise support in a safe manner in accordance with applicable State safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926) and in accordance with Section 31 50 00.

2. Furnish, and place the supports and shoring required to maintain stability of all sides of the excavations.

E. Notify Engineer at least 1 working day in advance of completion of any structure excavation to allow inspection of the exposed subgrade before it is covered with backfill or with any construction materials.

F. Erosion Control:

1. Maintain earthwork surfaces true and smooth and protected from erosion.

2. Construct erosion control measures identified in the Erosion and Sediment Control Plan prior to any clearing or grading activity.

G. Control of Water: Control water entering the excavation as indicated in Section 31 23 19.

H. Existing Underground Utilities:

1. Known existing underground utilities are generally shown on the Drawings in their approximate locations based on information of varying accuracy.

2. Exercise care to avoid damage to all existing utilities whether shown or not.

3. Conduct field explorations to locate all underground utilities in the vicinity of the Earthwork activities in accordance with Section 31 10 00.

4. Alert the Engineer of the presence of existing utilities that are not shown on the Drawings or are in locations different than those shown on the Drawings.

I. Existing Overhead Utilities: There may be existing overhead utilities in the vicinity of the Work which may or may not be shown on the Drawings. Identify existing overhead utilities, if any, and use extreme caution when working in the vicinity of overhead utilities.

3.02 EXCAVATION FOR FILLS AND EMBANKMENTS

A. Benching and Keyways:

1. Where fill is to be placed against existing subgrade or existing grade that is sloped, excavate horizontal benches a minimum of 5 feet wide and located at vertical intervals of not more than 5 feet to provide for placement and compaction of the new fill on horizontal surfaces.

2. Excavate keyway along the base of the existing slope:

3. Extend the keyway at least 3 feet into competent native soil.

4. Width of Keyway: Minimum of 15 feet.

5. Keyway Side Slopes: Inclined at approximately 0.75:1.

6. Keyway Subgrade: Scarify the upper 8-inches of the exposed surface, moisture condition and re-compact.

B. Subgrade Preparation:

1. Subgrade Beneath Embankments:

2. Expose competent native soil within the planned new embankment footprint.

3. Scarify the exposed subgrade to a depth of 12 inches or depth to bedrock, moisture condition as necessary and re-compact.

4. Subgrade Beneath Paved Areas:

   a. Excavate to the subgrade soils beneath the bottom of the subbase.

   b. Place reinforcement geotextile as shown on drawings.

   c. Finished subgrade shall be even, self-draining, and in conformance with the slope of the finished pavement.

5. Subgrade Beneath Structures:

6. At grade structures

   1) Excavate 3 feet of undocumented fill or to basalt rock layer and replace with compacted imported structural fill.

   2) Extend imported structural fill horizontally beyond the exterior perimeter of the building and footing a distance equal to the height of the fill or 3 feet whichever is greater.

7. Below grade structures

   1) Excavate to basalt rock layer and replace with compacted imported structural fill.

   2) Provide a minimum of 2 and a maximum of 12 inches of imported structural fill as leveling course for spread and continuous footing over the basalt rock subgrade.

   3) Provide a 6-inch layer of imported structural fill for mat foundation over the basalt rock subgrade.

4) Extend imported structural fill horizontally beyond the exterior perimeter of the building and footing a distance equal to the height of the fill or 3 feet whichever is greater.

3.03 EXCAVATION IN VICINITY OF TREES

A. Except where trees are indicated to be removed, protect trees form injury during construction.

B. Do not cut tree roots over 2 inches in diameter without permission of the Engineer.

C. Support trees during excavation by means approve by the Engineer.

3.04 OVER-EXCAVATION NOT ORDERED OR INDICATED

A. Backfill areas over-excavated with the materials indicated for the backfill above the over-excavation or Aggregate Base.

B. Backfill the over-excavation to restore the required subgrade elevation and compact.

C. Any over-excavation carried below the grade indicated on the Drawings will be at no additional cost to Owner.

3.05 OVER-EXCAVATION WHERE ORDERED BY ENGINEER

A. Where ordered by the Engineer, over-excavate beyond the depth of subgrade indicated to the dimensions ordered.

B. Backfill areas over-excavated with the materials indicated for the backfill above the over-excavation or Aggregate Base.

C. Backfill the over-excavation to restore the required subgrade elevation.

D. Over-excavation less than 6 inches below the limits indicated: At no increase in cost to Owner.

E. Over-excavation greater than 6 inches below the limits indicated: Payment will be made under separate unit price bid items for over-excavation if such bid items have been established. Otherwise, payment will be made in accordance with a negotiated price.

F. Measurement and Payment

1. Measurement of quantities for payment of over-excavation: By calculation by Engineer of the volume of materials removed as over-excavation based on the difference between the excavation dimensions before and after the over-excavation work. No compensation will be made for removal of materials beyond the limits of the additional excavation ordered by Engineer or for materials which may come into the excavation from outside the designated limits. No compensation will be made for removal of materials that are outside of the minimum horizontal dimensions indicated.

2. Payment for over-excavation will be made by the cubic yard. The payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in excavating and backfilling the over-excavation completely. Payment shall also include full compensation for the removal and disposal of the excavated materials, import and installation of backfill materials, control of water in the excavation, excavation support, and all

costs associated with interruption of construction operations during the review of the foundations, over-excavation, backfill, and all other operations required for, or as a result of, over-excavation.

3.06 ROCK EXCAVATION

A. Perform rock excavation in accordance with Section 31 23 16.26.

3.07 DISPOSAL OF UNSUITABLE, EXCESS EXCAVATED AND OTHER MATERIALS

A. The Owner has identified a site for disposal of clean excess excavated earth materials located at Quarry Park, 3101 Zelkova Street, Sweet Home, Oregon 97386. The Contractor may use a different disposal site with written authorization from the property owner of the disposal site. Clean materials shall meet the requirements of Section 2.01.A.1.

B. Dispose unsuitable materials at an appropriate site selected by Contractor unless otherwise indicated.

C. Obtain required permits, landowner, and agency approvals for disposal of unsuitable and excess excavated materials and pay costs associated with the removal and disposal of the materials.

3.08 FILL AND EMBANKMENT CONSTRUCTION

A. Scarify foundation soils for fills and embankments bring to optimum moisture content, and re-compact with heavy compaction equipment to obtain compaction indicated.

B. Place and compact fill and embankments in horizontal layers so that when compacted layers to not exceed thickness indicated.

C. Provide keyways or benches where an embankment or fill is to be placed against slopes, hillsides, or fill slopes.

D. Slopes: Construct slopes as indicated except construct no permanent fill or embankment slopes with slope inclinations that exceed 2:1 (horizontal: vertical) unless specifically indicated otherwise

E. Over-construct fills and embankments beyond the horizontal dimensions than indicated. Cut back slope following placement and compaction to expose well compacted fill.

F. Construct the first 3 feet of embankment or fills over pipelines using placement and compaction equipment that do not damage the pipe. Keep heavy construction equipment a minimum distance of the edge of the trench equal to the depth of the trench until at least 3 feet of fill over the pipe has been placed and compacted.

3.09 STRUCTURE BACKFILL

A. Provide Structure Backfill material within 12-inches of all structures to be backfilled unless otherwise indicated.

B. Place a 6-inch layer of structural fill below all structures, unless otherwise indicated.

C. Do not drop backfill upon any structure or pipe.

D. Confirm concrete structures have attained sufficient strength to withstand the backfill loads imposed.

E. Do not place backfill around water retaining structures until structures have been tested and approved for backfill. Fill structures with water during backfill operations.

F. Place backfill after all water has been removed from the excavation and the excavation sidewalls and subgrade soils have dried to a moisture content suitable for compaction.

G. Remove all loose, sloughing, or caving soils and rock materials prior to placement of backfill.

H. Place geotextile fabric as indicated.

I. Promptly after removal, fill voids created by the extraction of sheetpile or shoring indicated in Section 31 50 00.

J. Place backfill and spread evenly in layers so that when compacted layers do not exceed thickness indicated.

K. Thoroughly mix layers as necessary to promote uniformity of material in each layer.

L. Add water to backfill material such that moisture content is below the optimum moisture content and mix with the soil until the proper moisture content is achieved throughout the soil layer.

M. Where backfill material moisture content is too high to permit the specified degree of compaction, dry backfill material until moisture content is satisfactory.

3.10 COMPACTION OF FILL, BACKFILL, AND EMBANKMENT MATERIALS

A. Adjust moisture condition of soils to achieve a water content of 2 percent, plus or minus 0.5 percent, above the optimum moisture content as determined through moisture density testing of the soil.

B. Compact each layer in a uniform and systematic manner.

C. For materials with less than 10 percent passing the No. 4 sieve, compact by means of at least 2 passes from a flat plate vibratory compactor.

D. For materials with 10 percent or more passing the No. 4 sieve, mechanically compact to the indicated percentage of density each layer of backfill materials.

1. Use equipment that is consistently capable of achieving the required degree of compaction.

2. Compact each layer over its entire area while the material is at the required moisture content.

E. For wall backfill placed within 3 feet of the wall use hand-operated tamping equipment, such as jumping jack or vibratory plate compactors.

F. Do not use flooding, ponding, or jetting as a method of compaction.

G. Do not use equipment weighing more than 10,000 lbs closer to structure walls than a horizontal distance equal to the depth of the fill at the time. Use hand operated power compaction equipment where use of heavier equipment is impractical or restricted due to weight limitations.

H. Compaction Requirements:

1. Where agency or utility company requirements govern, the highest compaction standards shall apply.

2. Compact finish and subgrades in compliance with the following table:

Location or Use of Fill	Limit/Layer Thickness	Percentage of Maximum Dry Density of Compacted Material per ASTM D1557
Imported Structural Fill General Use	8 in. Layers	92
Backfill within 3 feet of walls	Less than 6 in Layers	90
Upper 2 feet of backfill within 3 feet of walls when sidewalks or pavements are placed above the backfill	Less than 6 in Layers	95
Embankment Fill	12 in. Layers	90(1)
Subgrade beneath embankments or fill areas (upper 8 inches)	Upper 12 in.	92
Subgrade beneath structures	8 in. Layers.	92
Subgrade beneath keyway (upper 8 inches)	Upper 8 in.	95
Finish grade in unimproved or landscape areas	Upper 12 in.	85
(1) If embankment fill is non-moisture-density testable, compaction shall be assessed by proof-rolling per ODOT TM158 or other visual means per the Engineer.		

3.11 FIELD QUALITY CONTROL AND TESTING

A. Field quality control testing for compaction confirmation will be done by a testing laboratory of the Owner's choice at the Owner's expense except as indicated below.

B. If requested by the Owner, remove soil above the level at which the Owner wishes to test. Backfill and re-compact material after testing is completed.

C. If compaction fails to meet specified requirements, perform remedial work by one of the following methods:

1. Remove and replace backfill at proper density.

2. Bring density up to specified level by other means acceptable to Owner.

3. Retesting:

a. Costs for conducting additional tests to confirm and verify that remedial work has brought compaction within specified requirements shall be borne by the Contractor.

b. Conduct compaction tests at twice as frequently specified for the initial confirmation tests.

D. Where soil compaction is specified as a percentage of maximum dry density, determine the maximum dry density at optimum moisture content by laboratory testing in accordance with Method C of ASTM D1557.

E. Where compaction of cohesionless, free draining soil is specified as a percentage of relative density, determine relative density by laboratory testing in accordance with ASTM D1557.

F. Determine In-Place Density of Compacted Fill Material by performing field tests of soil density in accordance with ASTM D6938.

G. Frequency of Compaction Confirmation Testing at intervals not less than as follows:

1. Each lift shall be tested prior to placing a subsequent lift.

3.12 FINISH GRADES

A. Surface: Reasonably smooth and free of grade breaks, irregular surface changes, protrusions and other defects.

B. Restore un-improved areas back to pre-construction grades.

C. Backfill topsoil in all areas where the topsoil was removed as part of the site preparation.

D. Restore drainage swales and water courses to their pre-construction alignments and grades unless otherwise modified by the Work. Grade surface to drain away from structures. Direct drainage to collection points.

E. Provide smooth transitions to existing grades.

F. Repair and reestablish grades to required elevations and slopes due to any settlement or erosion that may occur prior to final acceptance.

G. Vertical Tolerance:

1. Subgrade under paved areas: 0.0 feet above and 0.08 feet below.

2. Subgrade under structures: 0.0 feet above and 0.08 feet below.

3. Landscaped areas: 0.1 feet above and 0.1 feet below.

4. Unimproved areas: 0.1 feet above and 0.1 feet below.

END OF SECTION

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SECTION 31 10 00

SITE PREPARATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Site preparation work, as follows:

1. Locating existing facilities.
2. Installing safety and protective barriers.
3. Constructing temporary access roads, work areas and storage areas.
4. Clearing, grubbing, stripping, and other initial work required for earthwork and trenching operations.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals

1.03 DEFINITIONS

A. Clearing and Grubbing: Consists of removal of natural obstructions and man-made objects and features including foundations, buildings, fences, lumber, stumps, debris, rubbish, brush, trees, boulders, and other items that interfere with construction operations or are specifically designated for removal.

B. Stripping: Includes the removal and disposal of sod, grass, weeds, roots, and other organic material remaining after clearing has been completed.

1.04 SUBMITTALS

A. Comply with Section 01 33 00.

B. Submit:

1. Materials used and layout of temporary fences
2. Proposed staging and stockpile locations.

PART 2 - PRODUCTS

2.01 TEMPORARY FENCES

A. Type: Heavyweight, high visibility, flat laminar mesh design.

B. Material: High-density polyethylene.

C. Height: 48 inches.

D. Posts: Wood or metal posts at 10-foot spacing. Secure fence to posts with plastic cable ties.

PART 3 - EXECUTION

3.01 LOCATING EXISTING FACILITIES

A. Review the design drawings, maps, and other sources of information and identify existing facilities at the site to determine and mark the approximate locations of underground facilities.

B. Follow rules adopted by the Oregon Utility Notification Center regarding locating and marking existing buried utilities and contact owners of existing underground utilities prior to beginning work in the vicinity of their utilities.

C. Locate all existing utilities by exploratory excavations after field marking by the utility agencies and prior to any excavations in the affected areas.

3.02 SAFETY AND PROTECTIVE BARRIERS

A. Along Public Roadways:

1. Install appropriate barriers such as temporary fencing, plastic drums, or concrete traffic barriers to protect public from construction areas and to protect workers and existing facilities from danger of passing vehicles.

B. Temporary Fences:

1. Prior to beginning excavation, erect temporary fences along boundaries of the work area indicated on the Drawings.

2. Maintain work activities within the confines of the temporary fences.

3. Remove temporary fences when work in the vicinity is substantially complete.

C. Existing Trees: Erect temporary fences around trees at the drip line that are adjacent to the Work and may be subject to damage unless protected. Maintain work activities outside of protected areas.

D. Provide protective concrete slabs, steel plates or encasements for existing buried facilities that may be damaged by Contractor's equipment and vehicles.

3.03 PRIMARY SITE ACCESS, WORK AND STORAGE AREAS

A. Coordinate with the Owner and Engineer to develop primary access routes, work areas and storage areas.

B. Protect subgrade soils in stripped and graded areas as follows:

1. Place a minimum of 12 inches of crushed rock base material in temporary construction traffic areas.

2. Place a 18-24 inches of crushed rock base material to as necessary to protect subgrade soils in heavily traveled construction traffic areas.

3. Place a minimum of 4 inches of crushed rock base material in pedestrian areas.

C. Clean up areas at the conclusion of the project and return the areas to their original or better condition.

3.04 CLEARING

A. Clear construction areas of objectionable items and material, which, if left in place, would interfere with the proper performance of the work.

B. Remove loose boulders within 10 feet from the tops of cut slopes. Incorporate boulders into landscaping or remove from the site.

C. Dispose of material from clearing operations in an acceptable off-site location.

3.05 STRIPPING

A. Remove the top layer of soil containing sod, grass, weeds, other vegetation, and organic material to a depth of 6 inches from areas that will be affected by construction and site grading operations.

B. Extend stripped areas at least 4 feet beyond the limits of cut and fill areas.

C. Protect soils in stripped areas as described in Section 3.03.

D. Dispose of stripped material in an acceptable off-site location.

3.06 REMOVAL OF EROSION CONTROL DEVICES

A. Remove erosion control devices when bare soils are sufficiently revegetated to prevent on-site or off-site soil erosion, if authorized by the Engineer.

B. Straw wattles containing plastic netting, including plastic specified as phot-degradable, may not remain on site. Remove entire wattle or remove and dispose of plastic netting and spread straw from wattle across vegetated areas of site.

END OF SECTION

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SECTION 31 23 16.26

ROCK EXCAVATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Rock excavation exceeding the capability of conventional equipment.

B. Blasting requirements.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals

2. Section 31 00 00 – Earthwork

1.03 DEFINITIONS

A. Rock Excavation.

1. General:

a. Removal of solid material which by actual demonstration cannot, in Owner's Representative's opinion, be reasonably removed using conventional excavation equipment and must be systematically broken by power-operated hammer, hydraulic rock breaker, expansive compounds, blasting, or other similar means prior to removal.

b. For excavation of solid material that cannot be removed using an excavator or tractor in good working condition having a minimum flywheel power of 220-mechanical horsepower (164 kilowatt) and equipped with manufacturer's standard boom, single tooth rock ripper, and rock points on a rock ripping bucket no wider than 36 inches, or similar approved equipment, will be considered rock for the purpose of payment.

2. Term "rock excavation" indicates removal of solid material, as specified above, and does not necessarily correspond to "rock" or "bedrock" as implied by names, geologic formations, or other definitions provided in the Oregon Standard Specifications for Construction or other documents outside of this specification.

1.04 SUBMITTALS

A. Submit the following shop drawings, plans and product information per Section 01 33 00:

1. Permits: The Contractor shall obtain all required local, State, Federal, and the utility owners' permits and shall submit to the Owner's Representative, a copy of all applicable permits for transportation, storage, and use of explosives.

2. At least 28 days prior to drilling any blast hole, the submit the resumes for the Owner's Representative's approval the resumes of the Contractor's Blasting Consultant, Blasting Supervisors (Blasters-In-Charge), and personnel performing preconstruction blast surveys.

3. At least 28 days prior to drilling any blast holes, the submit a Project-specific General Blasting Plan to the Owner's Representative for review. The Contractor's Blasting Consultant shall visit the Site and prepare the Plan. The plan should include:

    a. A scaled plan drawing showing the approximate location and extent of the Contractor's blasting operations.

    b. A schedule of neighborhood pre-blast advisories, notifications and pre-blast structural surveys; a description of shot clearing and guarding procedures.

    c. A description of the anticipated road closures required during blasting operation,

    d. A tabulation of the nearest distances to structures within the specified blast generated seismic influence zone.

    e. A description of the drill and blast operation providing: the blast hole diameters and range of depths, the types of explosive to be used, the length of the stemming columns and the type of stemming material, the type of initiation system to be used, the methods used to control fly rock and sufficient information to determine the acceptability of the proposed blasting, and conformance with Paragraph 3.03.D, Blasting Limitations, hereinafter.

4. For each kind of blasting agents and explosives to be used, submit the perchlorate content provided by the suppliers and/or manufacturers. The Contractor has to obtain written permission from the Owner's Representative to use perchlorate-containing explosive products.

5. At least 14 days prior to drilling any blast holes the submit to the Owner's Representative manufacturer's product information sheets and Material Safety Data Sheets (MSDS) for all explosives, blasting agents, primers, and initiating products the Contractor proposes to use.

6. At least 24 hours before drilling any blast holes, the submit a Site-Specific Pre-blasting Blast Plan to the Owner's Representative for review and approval. The Pre-blasting Site-Specific Blast Plan shall include the following minimum information:

    a. A Site-specific plan view showing the blast area(s) and distances from the blast to all structures within 300 feet. The plan shall show the locations and distance to buried structures including buried utilities and pipelines within 100 feet of blast areas. Should the rock excavation require more than one blast, the plan shall show the anticipated footprint of each blast and the sequence in which the blasting will occur.

    b. A section view or profile of the blast area showing the top of ground, the rock/overburden contact and the bottom elevation limits of the excavation.

    c. The maximum weight of explosives to be detonated in any discrete 8 millisecond incremental time period.

7. Review and approval of any blasting plan by the Owner's Representative shall not relieve the Contractor of their responsibility for obtaining adequate rock breakage and limiting rock breakage to within the design excavation final lines and grades.

8. Submit a Blast Report Form or approved equal to the Owner's Representative before 9 am the day following each blast. The report shall contain the information required in Paragraph 3.03.G, Blasting Records.

9. Pre-blast Survey: At least 7 days prior to loading blastholes, submit Pre-blast Inspection Report including the information described in Section 1.07.

1.05 REFERENCES

A. Oregon Occupational Safety and Health Code (OR-OSHA), Division 3 Construction, Subdivision U – "Blasting and Use of Explosives," Sections 1926.900 through 1926.914.

B. Oregon Revised Statutes for Explosives, 480.010 through 480.290 and Administrative rules 837-12-1200 through 837-12-1420. The rules are administered by Oregon's Office of State Fire Marshal and govern the sale, possession, transfer of explosives, and the required certificates.

C. Code of Federal Regulations (CFR): Bureau of Alcohol, Tobacco, and Firearms (ATF): 27 CFR 555.

D. National Fire Protection Association:

1. 495: Explosive Materials Code.

E. Blast Vibration Monitoring:

1. International Society of Explosive Engineers (ISEE), 2011, Blaster's Handbook, 18th edition, Appendix E, Seismograph Field Practice Guidelines.

1.06 QUALIFICATION OF BLASTING PERSONNEL

A. Provide the services of an independent, qualified Blasting Consultant, experienced in controlled and sinking cut blasting techniques for similar civil and hydraulic works, to prepare blasting plans, to supervise the installation of instruments, and to supervise the interpretation of recorded results. The Blasting Consultant shall have at least 10 years of experience and demonstrate satisfactory experience on 5 similar projects. These projects shall include blasting within 100 feet of occupied dwellings or utilities where good relations with owners of nearby private structures or utility and the public were maintained. The Blasting Consultant shall not be an employee of the Contractor, explosives manufacturer, or explosives distributor. The Owner's Representative shall review and approve or reject the Blasting Consultant.

B. Use experienced, competent Supervisors (Blasters-In-Charge) for all blasting operations. All blasting supervisors shall have at least 10 years of experience and be able to demonstrate satisfactory experience on at least 5 similar projects, including blasting within 100 feet of occupied dwellings or utilities. All blasters and blasting supervisors shall be properly qualified and licensed in accordance with applicable federal, state, and local regulations. The Contractor shall not allow prohibited persons as defined by the BATF (27 CFR Part 555) to transport, handle, or use explosive materials.

C. Use experienced and qualified personnel for conducting pre-blast condition surveys. Personnel conducting pre-blast surveys shall have at least 5 years of experience in conducting pre-blast condition surveys of structures and be able to demonstrate satisfactory experience on at least 3 similar projects. Personnel conducting pre-blast surveys shall be the employees of a firm regularly engaged in conducting such surveys and shall not be an employee of the Contractor or any explosives manufacturer or distributor.

1.07 QUALITY CONTROL AND ASSURANCE

A. Pre-blast/Post-blast Inspections:

1. Coordinate all necessary notifications with utility owners of any utilities within 100 feet of the blast.

2. Prior to blasting, inspections shall be made of residences and other private structures existing within a 300-foot radius of all blasting locations. Notify the Owner's Representative at least 7 days prior to the inspections so a representative of the Owner's Representative may be present.

3. Inspections shall meet the following conditions: The survey shall include documentation of interior subgrade and above grade accessible walls, ceilings, floors, roof, and visible exterior as viewed from grade level. It shall detail by videotape or photographs and notes and sketches the existing condition or structures. Existing crack damage, other structural problems or defects occurring inside and outside the structure shall be documented as follows:

   a. The location of the feature shall be noted on a scaled drawing,

   b. Feature dimensions (e.g. width, length, depth) shall be measured and documented.

   c. Feature shall be photo-documented. A scale such as a ruler or crack meter shall be included in the photograph.

4. Develop a pre-blast inspection report, including videotapes and photographs, and shall be submitted to the Owner's Representative. Photographs shall be electronically imported and included in the report. Scans of photographs shall not be allowed.

5. As construction progresses, reinspect, as often as necessary to verify that controlled blasting methods are not causing any new damage.

6. In the event any property owner denies access for the survey of structures within the specified limits, notify such property owner by certified mail, on the intent of the survey. If after 2 weeks, access is still denied, notify the property owner once again that this is the final notification. Submit two copies of all such correspondence to the Owner's Representative. Upon review of the correspondence, the Owner's Representative may waive the inspection requirements for property owned by the owners refusing access.

7. Post blast inspections shall be required for property where written or verbal damage complaints were made by property owners.

B. Damage Repair

1. In case damage from blasting occurs to existing structures, to any portion of the Work, or to the material surrounding or supporting the same that is intended to remain, remove such damaged Work, repair the work, and replace the material and perform such Work for repair or replacement as the Owner's Representative deems necessary. Repair all damage promptly, completely, and satisfactorily, at the Contractor 's sole expense.

2. Nothing contained herein shall relieve the Contractor of their responsibility for claims arising from the Contractor's construction operations, including blasting operations. Failure to inspect any structure required by these Contract Documents, or inadequacy of inspections shall not relieve the Contractor of their responsibility. The Contractor shall indemnify the Owner and the Owner's Representative for such claims.

1.08 SAFETY REQUIREMENTS

A. Explosives shall be handled, transported, used, controlled, and monitored as prescribed by the most stringent of rules specified in the referenced OSHA and ATF Standards, Oregon's Office of State Fire Marshal explosives regulations, this Section, and local codes and ordinances.

B. Keep explosives on the Site only in such quantity as needed for Work under way and only during time as being used. No overnight magazine storage of explosives shall be allowed within the Project limits. Only the amount of explosives to be used each day shall be on the Site. Promptly remove from premises remaining unused explosives and explosive product packaging materials when need for explosives has ended. All loaded blast holes are to be shot the day they are loaded.

C. Conform to State, Federal, and municipal laws, ordinances, and regulations relating to transportation, handling, and use of explosives. If any of above-mentioned laws, ordinances, or regulations require a licensed blaster to perform or supervise the Work of blasting, employ a licensed blaster. Require them to have a license on Site and permit examination by Owner's Representative or other officials having jurisdiction.

D. Conduct operations involving explosives with all possible care to avoid injury to persons and property. Do blasting only with such quantities and strengths of explosives and in such manner as will break rock approximately to intended lines and grades, leaving rock not to be excavated in an unshattered condition. Avoid excessive cracking of rock upon or against which any structure will be built. Prevent injury to existing pipes, structures, and property above or below ground. Cover rock with logs or mats, or both. Give sufficient warning to persons in vicinity of Work before a charge is exploded.

E. Complete blasting within a distance of 50 feet (15 m) before any portion of a masonry structure is placed or any pipe is laid.

F. Determine presence of two-way-radios, stray electrical currents and other conditions adversely affecting blasting operations and implement necessary precautions to prevent accidents and premature blasts.

1.09 SITE CONDITIONS

A. Protect structures, underground utilities, and other construction from damaged caused by blasting.

B. Subsurface conditions at the wastewater treatment plant are described in the Geotechnical Data Report prepared for this Project – see Supplementary Information in Volume 3 of the Contract Documents. It is the responsibility of the Contractor and the Contractor's Blasting Consultant to review and understand the rock mass characteristics at the Site.

PART 2 - MATERIALS

2.01 EXPLOSIVE PRODUCTS

A. To the extent practical, avoid the use of perchlorate-containing explosive products when surface or groundwater can be affected.

2.02 WARNING SYSTEMS

A. Institute a system of audible signals to warn of impending blasts.

B. Erect signboards of adequate size stating that blasting operations are taking place in the area. Such signs shall be clearly visible at all points of access to the area and shall clearly describe the audible signal system for warning of impending blasts.

C. Mark all day storage places and explosives transport vehicles with signs stating clearly and boldly, DANGEROUS EXPLOSIVES.

2.03 BLAST MONITORING INSTRUMENTATION

A. The Contractor with the assistance of the Contractor's Blasting Consultant shall provide and operate a minimum of three blast monitoring seismographs, at locations shown on the Drawings, to record particle velocity simultaneously along three mutually perpendicular axes.

B. Provide and operate a minimum of two approved air blast overpressure/sound monitoring devices at locations as directed by the Owner's Representative.

C. Blast monitoring instrumentation shall be 4-channel, (1 overpressure and 3 seismic channels) units capable of digitally storing collected data. Equipment shall be capable of printing ground motion time histories and summaries of peak motion intensities, frequencies, and USBM RI8507 ppv-frequency plots. Printed report records shall include date, time of recording, operator name, instrument-number, and date of last calibration. Instruments shall have a flat frequency response between 2 and 250 hertz (Hz) for particle velocity and from 2 to 200 Hz for air pressure.

D. Seismographs shall be capable of recording overpressure from 88 to 148 decibels (dBL), and a particle velocity from 0.005 to 10.0 ips, and shall be capable of performing a self-test of velocity transducers and printed event record shall indicate whether or not the sensor test was successful.

E. Blast monitoring equipment shall have been calibrated within 1 year of any blast monitoring.

F. Blast vibration monitoring shall be performed in general agreement with the 18th edition of the Blaster's Handbook, Appendix E, Seismograph Field Practice Guidelines, published by the International Society of Explosive Engineers (ISEE), 2011.

2.04 BLASTING MATS

A. Blasting mats shall weigh at least 25 pounds per square foot. Mats shall be a minimum of 6 feet by 10 feet and shall be equipped with suitable placement attachments.

PART 3 - EXECUTION

3.01 ROCK EXCAVATION

A. Conduct excavation in accordance with Section 31 00 00 and this Section 31 26 16.13.

B. If material is encountered that cannot be excavated by conventional equipment, notify Engineer immediately. Provide performance tests of the specified conventional or equivalent equipment demonstrating the equipment can perform to at least the level specified. If Engineer confirms in writing that the specified conventional equipment cannot perform at the production rates specified, the excavation shall be considered rock excavation.

C. A boulder may be considered rock excavation if, after the boulder has been exposed by excavation on all sides, neither type of conventional equipment can break up the boulder into pieces sufficiently small to enable removal by the specified equipment.

3.02 MEASUREMENT AND PAYMENT

A. Payment for rock excavation will be as provided in the Bid form as a unit price item for quantities in excess of the base bid quantity included in Contractor's lump sum bid. Payment for additional rock excavation shall be at the additive or deductive unit prices provided on the Bid Form.

B. Measurement and Payment

1. Measurement of quantities for payment of rock excavation shall be by calculation by Engineer of the volume of in-place materials removed as rock excavation. No compensation will be made for removal of materials beyond the limits of the rock excavation in the project drawings or ordered by Engineer or for materials which may come into the excavation from outside the designated limits. No compensation will be made for excavation wider or deeper than the minimum indicated.

2. Payment for rock excavation will be made by the cubic yard unless otherwise indicated. The payment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in excavating and backfilling the excavation completely, subgrade elevation indicated. Payment shall also include full compensation for the removal and disposal of the excavated materials, control of water in the excavation, excavation support, performance tests, costs associated with interruption of construction operations during performance tests and confirmation by Engineer, costs associated with the additional time required for excavation, and all other costs and operations required for, or as a result of, rock excavation.

3.03 EXPLOSIVES AND BLASTING

A. General

1. Conduct blasting, storage and handling of explosives in accordance with the Oregon Occupational Safety and Health Division (Oregon OSHA), Oregon Administrative Rules, Chapter 437, Division 3 Construction, Subdivision U, and Section 00335 of the Oregon Standard Specifications for Construction and any other authorities having jurisdiction.

2. Obtain all necessary permits and furnish copies to Engineer before explosives are transported to the Site.

3. Pay for permits at no additional cost to Owner.

4. Perform blasting only by skilled operators under the direction of a licensed blasting supervisor.

5. Submit blasting plan prepared by qualified person. Blasting plan to include

   a. Details of drilling and blasting pattern

   b. Vibration, flyrock and noise reduction methods

   c. Blast area security measures

   d. Traffic control

6. Identify all property, structures, and persons that may be affected by blasting and take all safety precautions and protective measures to prevent damage or injury to same.

7. All personal injury or damage to persons or property of any nature, whether in the Work or appurtenant to it, shall be the responsibility of Contractor.

8. Contractor agrees by submission of a bid to indemnify and hold Owner, its officers, agents, employees, and Engineer harmless from any and all liability claims, costs, and expenses as a result of blasting operations, including expenses of investigation and defending against same in regard thereto.

9. Perform basting only between 9:00 AM and 4:00 PM, Monday through Friday, except legal holidays, unless otherwise approved by Engineer and regulatory agencies having jurisdiction.

B. Blasting

1. Perform instrumented seismographic monitoring of blasting.

   a. Place a seismograph at the nearest structure to the blast to monitor the ground motion particle velocity and frequency during each blast.

   b. Provide one copy of each seismograph chart to Engineer.

   c. If blast results in unacceptable vibrations modify the blasting procedure.

2. Contain fly rock from blasting within the project site and prevent hazard to persons, vehicles, existing improvements, or vegetation.

3. Clean the blasting site of all debris at the end of each day.

4. Do not blast within 100 feet of concrete that has cured less than 7 days.

C. Blasting Limitations

1. The following limitations are mandatory for all blasting operations:

2. Road Closure Limitations:

   a. Road closures are required during blasting all blasts. Submit any anticipated road closures in the General Blasting Plan, per Paragraph 1.04 of tis Section. Traffic control for the road closures shall be in accordance with the most recent ODOT Traffic Control Plan Design Manual.

3. Work Hour Restrictions

   a. Blasting shall be performed between XX am and XX pm. No nighttime blasting shall be allowed.

D. Blasting Safeguards

1. The maximum charge weight per 8 millisecond (MS) delay shall be in accordance with the Scale Distance Formula, $W= (D/Sd)^2$, where W = weight of explosives per 8 MS delay, D = distance in feet to structure, Sd = selected scaled distance from test blasting, unless otherwise specified by the Owner's Representative.

2. The maximum charge weight per 8 millisecond delay (MS) delay shall be approximated by the use of the following equation, which shall be refined based on test blasts and experience gained as the Work progresses: $W = D^2 * (V/H)^{1.25}$, where W = maximum weight of explosives per delay period of 8 MS, in pounds, V = peak particle velocity, in inches per second, D = shortest distance between blast and the point of interest in feet and H = ground response factor, which equals 70 (unit-less) and shall be verified by test blasting, unless otherwise specified by the Owner's Representative.

3. The first blasting operation at each location shall be monitored by the Contractor as a test case, and the proper drill and blast parameters subsequently used shall be derived from the test results. The Scaled Distance for test shots shall be based on the Contractor's General Blasting Plan and such that the peak particle velocity at the nearest residence, private, public, community, or institutional building does not exceed 2.0 inches per second, or as directed by the Owner's Representative. Blast monitoring shall be continued for every blast round. Blast monitoring data recorded for each shot shall be furnished to the Owner's Representative prior to drilling for the next blast. Changes in drilling patterns and amount of explosives shall be made when records indicate vibration in excess of that specified herein.

4. If the measured air overpressure exceeds 0.014 psi (133 dB) at the nearest occupied dwelling adjacent to the blast zone or other designated location, the Owner's Representative may require up to a 3-day shutdown of Contractor's operations for inspection of facilities. This delay shall be at no additional cost to the Owner and shall not constitute the basis for any claim.

5. If for any blast, the measured peak particle velocity or airblast exceeds the limits in this specification, the Contractor's Blasting Specialist shall review the Contractor's blasting methods and the Contractor shall submit a revised Blasting

Plan for the Owner's Representative's approval to conducting additional blasting activities.

6. In reporting a shot, the distance from the shot to each recorder, the amount of explosives used in each delay, the total amount of explosives used, and the time shall be noted. No separate or direct payment shall be made for monitoring of blasts, as all costs shall be considered incidental to, and included in, the applicable items of the Contract.

7. Cover the area to be shot with blasting mats or other approved type of protective material that will prevent the scattering of rock or other fragments. Give ample warning to all persons within the vicinity prior to blasting and provide signals warning of danger in suitable places to alert people in vehicles before firing any blasts. If flyrock projects past the guarded area of the shot or lands on private property, all blasting operations shall cease until the Contractor's Blasting Consultant reviews the Site and determines the cause of the flyrock and submits a revised shot plan for the Owner's Representative's approval.

8. After a blast has been fired, the blaster shall make a careful inspection to determine that all charges have exploded before employees are allowed to return to the operation. Misfires shall be corrected in accordance with the requirements of the applicable portions of Federal, State, and/or local safety codes for blasting. The Contractor shall be responsible for any and all damages to property or injury to persons resulting from blasting, or accidental or premature explosions that may occur in connection with the use of explosives.

9. All loose and shattered rock or other loose material, which may endanger any structure or the workers, shall be removed and the excavation made safe before proceeding with the Work. After muck removal and before drilling of blast holes for a new round, the face shall be cleaned and thoroughly examined for missed holes and unexploded powder. Blasting techniques shall be developed and improved as Work progresses. The fact that the removal of loose or shattered rock or other loose material may enlarge the excavation beyond the required limits shall not relieve the Contractor of the responsibility for removal of such material.

10. Whenever, in the opinion of the Owner's Representative, proposed blasting may cause harm to persons or private property, cause damage to structures, or create rock face instability, cease blasting immediately and review the blast design. The Contractor can resume excavation of the rock after redesigned blast plan has been approved by the Owner's Representative or by mechanical methods.

E. Blasting Test Shots

1. The Contractor shall demonstrate that the proposed blasting method meets the Project objective to the Owner's Representative by making test shots.

2. Test shots may form final rock faces upon approval of the Owner's Representative.

3. The first sinking cut shot in the shaft shall be a test blast.

4. The Contractor's Blasting Consultant shall be present to witness each test blast.

5. The Owner's Representative shall be the sole judge as to the acceptability of the proposed method. If the test is unacceptable, the Contractor, with the assistance of the Blasting Consultant, shall modify their proposed blasting method and perform additional tests until the method is acceptable.

F. Blasting Records

1. Complete the Blast Report Form for each blast detonated, and be submit to the Owner's Representative along with a Blasting Ground Motion Record (seismograph and airblast record) before 9 AM of the following day after each blast. This record shall include the following:

   a. Depth of blast holes and the location of the blast point in relation to Project stationing; type and strength of explosives, type of blasting caps, and distribution of delays used; vibration record including USBM RI8507 ppv-frequency plot; total explosive loadings per round and per delay; comments by the blaster in charge regarding any misfires, unusual results or unusual effects; date and initiation time of blast; name and signature of the Blaster-in-Charge and any other records required by State, Federal, and local codes and/or regulations.

   b. Failure to submit the Blast Report Form shall be grounds for the Owner's Representative to suspend the Contractor's drilling and blasting operations until the required reports have been submitted.

G. Post-Blast Investigation and Report

1. Perform post-blast inspections of each structure included in the pre-blast survey.

2. Perform post-blast inspections with a qualified independent inspector provided by the Contractor.

3. Use pre-blast survey forms for each structure to indicate no damage has occurred as a result of the blasting operation, sign forms following inspection, and submit one copy to the Owner.

4. Where damage has occurred, investigate the damage and provide a written report to Engineer within 30 days of identification of the damage or receipt of the complaint.

END OF SECTION

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SECTION 31 23 19

DEWATERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Control of water and dewatering of trench and structure excavations.

1.02 RESPONSIBILITY FOR DESIGN

A. Assume responsibility for planning, design, installation and operation of temporary groundwater dewatering systems and temporary surface water control systems. Water control systems designed and installed by the Contractor shall adequately protect existing property, foundations and permanent structures.

B. Utilize the services of a Registered Hydrogeologist, Professional Civil Engineer, or Certified Engineering Geologist to develop the Groundwater Control Plan (GWCP) and the design of the groundwater and surface water control systems to achieve specified results. Professional registration shall be for the State of Oregon.

C. Assume sole responsibility for loss or damage resulting from partial or complete failure of operation of dewatering systems.

D. Assume responsibility for repairing damage to adjacent properties, buildings, structures, utilities and other work due to settlement or resultant damage caused by the groundwater control operations.

E. Determine means and methods for disposing of water removed by dewatering systems. If permit requirements specify water quality requirements that must be met before water can be disposed, provide the necessary treatment facilities to achieve the specified water quality limits

F. Modify groundwater control systems or operations if they cause or threaten to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells, or affect potentially contaminated areas.

G. When additional information is needed for design of dewatering systems, conduct subsurface investigations to identify groundwater conditions and to provide parameters for design, installation, and operation of groundwater control systems

1.03 RESPONSIBILITY FOR SECURING PERMITS

A. Obtain all necessary permits, including those required by Oregon Water Resources Department (OWRD) for dewatering wells and monitoring wells, a 1200-C Storm Water Discharge General Permit from the Oregon Department of Environmental Quality (DEQ) for discharge of groundwater, and those required by the City of Sweet Home for discharge to the local sewer system.

B. Pay all costs associated with permitting, decommissioning and removal of all dewatering systems when no longer in use.

C. Comply with the sampling, testing, monitoring, and reporting requirements specified in permits secured for dewatering operations.

1.04 PERFORMANCE REQUIREMENTS

A. General

1. Groundwater control systems may include single-stage or multiple-stage well point systems, sump pumps within excavations, shallow or deep wells, or combinations of these types of dewatering systems.

2. Locate groundwater control and drainage systems so as not to interfere with utilities, construction operations, vehicular traffic, adjacent properties, or adjacent water wells.

3. Modify dewatering procedures which cause, or threaten to cause, damage to new or existing facilities, so as to prevent further damage. Install settlement gauges, as necessary, to monitor settlement of critical structures or facilities adjacent to areas of dewatering. Control the rate of dewatering to avoid all objectionable settlement and subsidence.

4. Install piezometers to monitor groundwater in the area of the excavation, as well as the natural groundwater elevation. Install piezometers in the locations specified elsewhere in this Section.

5. Remove or abandon dewatering system when it is no longer needed in accordance with regulatory stipulations indicated in this Section.

B. Project Conditions

1. Anticipate encountering groundwater in all excavations.

2. Groundwater may be free-flowing into excavations or may be encountered in the form of saturated soil.

C. Requirements for Dewatering of Excavations:

1. Design dewatering systems of sufficient scope, size, and capacity to accomplish the following results:

a. Control the flow of surface water into trench and structure excavations by grading, dikes, or other means.

b. Lower groundwater levels and eliminate infiltration of groundwater into trench and structure excavations, allowing construction to proceed on dry, stable subgrade.

c. Lower and maintain groundwater below the lowest point of excavations.

d. Lower groundwater levels further when necessary to prevent flotation and damage from hydrostatic pressure and to obtain the specified degree of compaction. Develop substantially dry and stable subgrade for subsequent earthwork compaction and construction operations.

e. Prevent the loss of fines, seepage, boils, quick conditions, or softening of the foundation soils.

f. Maintain stability of sides and bottoms of excavations.

D. Requirements for Protection of Existing Structures

1. Provide, operate and maintain dewatering systems of sufficient size and capacity to protect existing structures from hydrostatic uplift when the structure is drained of water.

2. Protection against hydrostatic uplift entails lowering the groundwater table in the immediate vicinity of the structure to be drained until the groundwater elevation is at least 12 inches below the top of slab elevation of the structure.

E. Operation of Dewatering Systems

1. Maintain dewatering operations to control and minimize erosion, to create stable sides and bottoms of excavations, to stabilize constructed slopes and to prevent settlement and damage to structures and utilities.

2. Collect and dispose of removed water. Water removed by dewatering systems cannot be discharged into the storm water collection system which consists of pipes, catch basins, manholes and roadside drainage ditches. Discharge water to wastewater treatment plant. Coordinate discharge location, quality and quantities with City prior to discharge.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Comply with requirements of agencies having jurisdiction.

B. Comply with all laws and regulations for development, drilling, and abandonment of wells used in dewatering systems.

C. Obtain a 1200-C Storm Water Discharge General Permit from the Oregon Department of Environmental Quality (DEQ) under the National Pollutant Discharge Elimination System (NPDES) for discharge of collected groundwater from the construction site.

D. Obtain all necessary permits from agencies with regulatory jurisdiction over groundwater pumping, matters affecting well installation and the use of existing storm drains and natural water drainage courses.

E. Take early action and allow time for the review, as permitting processes may be lengthy. Take early action to pursue and submit for the required approvals.

1.06 SUBMITTALS

A. Notify the Owner's Representative immediately after any material change or proposed change in the character, volume, treatment or disposal methods of the discharge.

B. Additional Shop Drawings for Specific Locations

1. Submit design details of dewatering systems and water treatment systems that will be utilized at the specific locations listed herein.

2. Design of the dewatering system shall be prepared by a Registered Hydrogeologist, Professional Civil Engineer, or Certified Engineering Geologist registered in the state of Oregon and shall be coordinated with the design of the excavation support systems that the Contractor proposes to use at these locations.

3. Provide shop drawings that are signed and sealed by the responsible Engineer or Certified Professional licensed in Oregon.

4. Illustrate the arrangement, locations and details of the dewatering system, including wells and well points; dewatering pumps and piezometers; locations of headers, treatment systems and discharge lines; standby equipment and power supply; silt removal, pollution control and treatment facilities; and the means of conveyance, discharge and disposal of water.

5. Include a narrative report outlining the dewatering procedures and controls.

6. Submit a minimum of six weeks before any work referred to in the submittal is scheduled to commence.

C. Groundwater Control Plan (GWCP)

1. Proposed plan for the design, control, transport, treatment, operation, disposal of water, signed and sealed by the designer. Include with this proposed plan a drawing that indicates the number and location of the dewatering wells to be installed for the Work.

2. Include the following in the GWCP:

a. Calculations for the design of each system, including a statement of design assumptions, system description, and basic design criteria. Quantify the peak discharge rate of each system into receiving storm water and sanitary sewers.

b. Schedule and procedures for installation, start-up testing protocol, and removal of each system.

c. Location, dimensions, and capacity of wells, retention basins, treatment ponds, tanks, and treatment plants.

d. Sizes, locations, and types of discharge lines, ditches, sumps, and flow measurement devices.

e. Details of dewatering systems for shafts, including well sizes, locations, gradation of filter materials, and calculations for compatibility with screen and ground.

f. Types, capacities and numbers of pumps, generators, and standby units.

g. Design and construction of all electrical installations.

h. Details for the collection of water in tunnel and shafts, its conveyance to the treatment point, its treatment of the water, and its discharge from the site.

i. Methods of measuring the flows in accordance with the requirements specified herein.

j. List of substances that may be introduced into discharges or increased in concentration due to the Contractor's means and methods of performing the Work.

k. Methods of monitoring groundwater level and water quality to check its compliance with all regulatory requirements prior to its discharge from the site.

l. Methods for diverting or collecting, monitoring, and treating as necessary prior to discharge all storm water.

m. Methods for collecting, handling, treating and disposing of water and byproducts from excavated materials stockpiled on site.

n. Copy of approved permits (i.e. discharge permits).

o. Copies of all daily reports specified herein.

3. Timing: Submit GWCP within 21 calendar days of the Notice to Proceed.

1.07 QUALITY CONTROL

A. Qualifications:

1. Name, address, phone number and professional registration of the designer of the dewatering systems.

2. Company and individuals responsible for the operation of the facilities.

3. Independent testing laboratory responsible for testing treated effluent will be arranged for and provided by the City.

B. Certifications: Permit for discharge into local storm water and sewer systems.

C. Quality Control Plans

1. Method for assuring that water quality complies with regulatory requirements prior to its discharge from the site.

2. Methods demonstrating the ability of the automatic paging facilities, power transfer facilities, and backup systems to comply with specified requirements.

3. Methods for assuring that collection, handling, treatment, and discharge operations do not damage the Work in progress or impact the efficiency with which other Work is performed.

4. Calculations demonstrating capacity of system to store collected water on site to comply with permit restrictions for discharging.

5. Recordkeeping: Flow, water quality, and amount and type of treatment chemicals used on a cumulative basis. Provide daily, no later than 8 hours after records were taken.

D. Shop drawings of the dewatering system must be approved prior to beginning excavations.

1.08 QUALITY ASSURANCE

A. Reference Standards: Except as otherwise indicated the current editions of the following specifications and standards apply to the Work of this Section:

1. Oregon Administrative Regulations (OAR):

a. OAR 690-200, Well Construction and Maintenance.

b. OAR 60-210, Abandonment of Wells.

c. OAR 690-240 Construction, Maintenance, Alteration, Conversion and Abandonment of Monitoring Wells Geotechnical Wells, and Other Holes in Oregon.

2. Environmental Protection Agency (EPA)

   a. 40 CFR 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants.

   b. 40 CFR 261 - Identification and Listing of Hazardous Waste.

   c. 40 CFR 403 - General Pretreatment Regulations for Existing and New Sources of Pollution.

3. Qualifications:

   a. Designer of GWCP: Registered Hydrogeologist, Professional Civil Engineer, or Certified Engineering Geologist registered in the State of Oregon with a minimum of five years experience in the design, including monitoring and recording, of water collection, handling, and treatment systems similar to those required under this Contract.

   b. Installer and Operator:

      1) Company with at least five years experience in responsible charge of the installation and operation of water collection, handling, and treatment systems similar to those required for this project.

      2) Personnel operating and maintaining facilities with demonstrated experience in the operation of systems similar to those required for this project.

4. Preconstruction Meeting: Prior to beginning excavation, complete installation of the water treatment facility and arrange for a demonstration and test of all features, including automatic paging facilities, power transfer facilities and backup systems.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Furnish and maintain all materials, tools, equipment, facilities, and services as required for providing the necessary dewatering work and facilities.

B. Materials for Groundwater Extraction Wells and Groundwater Monitoring Wells:

1. Well Casing: Schedule 40 PVC or steel pipe. Size to be determined by Contractor, 8-inch minimum.

2. Groundwater Monitoring Well Casing: 2-inch diameter PVC pipe with 20 foot section of slotted screen.

3. Sand Pack: 10-20 silica sand.

4. Pump Size, Capacity, and Type (Extraction Wells): As selected by Contractor.

5. Provide locking security cap on top of well casing.

C. Collection and Discharge Pipes: Steel or PVC pipe and fittings.

D. Water Quality Treatment Equipment: Provide settling tanks with sufficient capacity for the flow rate and volume of water. Include chemical flocculation and filtration equipment as necessary to comply with water quality limits.

2.02 DEWATERING AND WATER CONTROL EQUIPMENT

A. Select equipment and materials necessary to achieve desired results for dewatering.

B. Use equipment that is in good repair and operating order.

C. Maintain sufficient standby equipment and materials available at the site to ensure continuous operation, where required.

2.03 GEOTEXTILE CONTAINMENT TUBES

A. Contractor may utilize a pervious geotextile containment tube for capturing and removing sediment from water collected during dewatering operations.

B. Tube Construction: Fabricated from woven, mono-filament or multi-filament pervious sheets of geotextile material and provided with filling ports and a pressure relief port.

C. Manufacturers: One of the following or equal:

1. Geocontainer, as manufactured by Ten Cate Nicolon.

2. Geotube, as manufactured by Texion Geosynthetics.

PART 3 - EXECUTION

3.01 NPDES PERMIT COMPLIANCE

A. Implement the Groundwater Control Plan as approved by the Oregon DEQ before beginning excavation.

B. Comply with all limitations and controls for water discharges, monitoring requirements and other special conditions specified in the permit.

3.02 MONITORING GROUNDWATER

A. Groundwater Monitoring Wells:

1. Install a minimum of three (3) groundwater monitoring wells for monitoring groundwater elevation upgradient and downgradient at each dewatering system location on the project site.

2. Measure and record groundwater elevation two times per week during the course of dewatering to lower the groundwater table.

3. When groundwater monitoring wells are no longer needed for monitoring ground water levels, abandon groundwater monitoring wells in accordance with Applicable laws and regulations.

B. Installation of Monitoring Devices

1. Construct well in accordance with the requirements of ASTM D5092, Standard Practice for Design and Installation of Groundwater Monitoring Wells.

2. Depth of Drilled Hole: Minimum 10 feet below required elevation of groundwater drawdown, or to the depth of bedrock.

3. Construction Methodology: Install monitoring wells using methods that do not use drilling mud.

3.03 DEWATERING

A. Perform dewatering in accordance with approved Shop Drawings. Keep the Owner's Representative advised of any changes made to accommodate field conditions and, on completion of the dewatering system installation, revise and resubmit Shop Drawings as necessary to indicate the installed configuration.

B. Organize dewatering operations to lower the groundwater level in excavations as required for prosecution of the Work, and to provide a stable, dry subgrade for the prosecution of construction operations.

C. Design, install and operate the dewatering systems so that fines are not removed from native subgrade and surrounding soils during dewatering.

D. Maintain water level at lower elevations, so that no danger to structures can occur because of buildup of excessive hydrostatic pressure, and provide for maintaining the water level below the subgrade, unless otherwise permitted by the Owner's Representative.

E. Maintain groundwater level a minimum of five feet below the prevailing level of backfill being placed.

F. Dispose of water in such a manner as to cause no injury or nuisance to public or private property, or be a menace to the public health. Dispose of the water in accordance with applicable regulatory agency requirements.

G. Dewatering of Pipe Trenches: Do not drain trench water through the pipeline under construction.

H. Maintain continuous dewatering operations so that the excavated areas are kept free from water during construction, while concrete is setting and achieves full strength, and until backfill has been placed to a sufficient height to anchor the work against possible flotation.

I. Prevent disposal of sediments to adjacent lands or waterways by employing necessary methods, including settling basins. Locate settling basins away from watercourses to prevent silt-bearing water from reaching the watercourse.

J. Where excavations may obstruct the natural flow of a watercourse, implement measures to control and dispose of the surface water that will not adversely affect water quality or beneficial uses of the watercourse. Divert watercourse flows around excavation areas by constructing barriers, temporary culverts, new channels or other appropriate means.

K. Do not allow water containing mud, silt or other pollutants from aggregate washing or other construction activities to enter a watercourse or be placed in locations that may be subjected to high storm flows.

3.04 SURFACE WATER CONTROL

A. Intercept surface water and divert it away from excavations through use of dikes, ditches, curb walls, pipes, sumps or other means. This requirement extends to temporary works required to protect adjoining properties from surface drainage caused by construction operations.

B. Implement the appropriate level of surface water control to protect water quality throughout the construction period.

C. Utilize Best Management Practices throughout the construction period.

3.05 GROUNDWATER CONTROL

A. Provide labor, material, equipment, techniques and methods to lower, control and handle groundwater in a manner compatible with construction methods and site conditions. Monitor effectiveness of the installed system and its effect on adjacent property.

B. Intercept water flowing into excavations and divert it to sumps or ditches to allow pumping of collected water out of the excavation.

C. Provide settling basins, geotextile containment devices or other sediment removal and water treatment devices for water quality control and compliance with regulatory and permit requirements.

1. Install geotextile containment devices in accordance with the manufacturer's instructions and requirements.

D. Operate and maintain groundwater control systems in accordance with the Groundwater Control Plan. Notify Engineer in writing of any changes made to accommodate field conditions and changes to the Work.

E. Provide for continuous system operation, including nights, weekends, and holidays. When deemed appropriate, provide backup power source for electrical service.

F. Monitor operations to verify that the system lowers groundwater levels at a rate required to maintain a dry excavation resulting in a stable subgrade for prosecution of subsequent operations.

G. Remove all groundwater control systems upon completion of construction or when dewatering and control of surface or groundwater is no longer required. Remove and grout piezometers when groundwater control operations are complete.

3.06 WELL ABANDONMENT

A. Abandon wells using a licensed water well contractor in accordance with OAR 690-220.

B. Include well abandonment costs, including permits and documentation, in the Lump Sum Price.

3.07 RECORDS

A. Provide a daily record of the average flow rate. Provide results of water quality testing as required by the Permit for discharge.

B. Observe and record the elevation of the groundwater during the period that the dewatering system is in operation.

END OF SECTION

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SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Temporary excavation support systems.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 31 00 00 – Earthwork

1.03 DEFINITIONS

A. Protection Systems:

1. Sloping or benching systems for excavated slopes.
2. Structural support systems, shield systems, and other systems for preventing excavation wall failure.

1.04 SUBMITTALS

A. Prepare and submit in accordance with Section 01 33 00.

B. Submit information as a complete package. Include all items required by the Contract Documents. Incomplete submittals will not be reviewed and will be returned for resubmittal as a complete package.

C. Shop Drawings

1. Prepared, signed, and sealed by a professional engineer who is registered to practice in the state of Oregon.
2. Clearly indicate structural sections of shoring members, welding details, bolting details, and bracing details.
3. Indicate existing and new structures, pipelines and other improvements located in the vicinity and impacting the design of the shoring system.
4. Provide details for bracing, reinforcement and sealing around penetrations.

D. Calculations: Structural calculations verifying and demonstrating the structural safety and adequacy of the sheeting, shoring, and bracing to be used.

1. Prepared, signed, and sealed by a registered Professional Civil or Structural Engineer who is registered to practice in the State of Oregon.
2. Provide calculations for the different load, support and other conditions that occur during the sequence of installation, construction of facilities protected by the shoring and the sequence of removal of the internal bracing and shoring.

E. Sheet Pile Driving Equipment: Information on type of equipment to be used, including manufacturer, model number and driving energy.

F. Qualifications of registered Professional Engineer and shoring installer, including project references.

G. Prepare a detailed plan illustrating the sequence of installation and removal of shoring systems and internal bracing. Include sketches showing the various stages in the sequence.

H. Letter confirming installation of the shoring system is in accordance with the shoring design.

I. Control Points and Stability Measurements:

1. Submit proposed location and details of control points and method and schedule for obtaining stability measurements.

2. Submit field notes documenting stability measurements.

1.05 INSTALLER QUALIFICATIONS

A. Shoring installer must have a minimum of five successful past installations of shoring systems of comparable overall heights and comparable penetration of soils similar to those found on the project site.

1.06 PERFORMANCE REQUIREMENTS

A. Design and install excavation support and protection systems that are capable of:

1. Supporting excavation sidewalls and bottom to maintain the required excavation or trench section.

2. Resisting soil and hydrostatic pressure and superimposed construction loads and other live loads.

3. Protecting existing facilities in the vicinity of the excavation from damage due to settlement or movement of soil

B. Provide professional engineering services necessary to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified professional engineer registered in the State of Oregon.

C. Install and remove excavation support and protection systems without damaging existing buildings, pavements, utilities, railroad facilities and other improvements adjacent to excavation.

D. Excavations

1. Protect workers from hazard of caving ground and other hazards.

2. Install excavation protection system in locations where:

a. Protection system is specifically indicated on the Drawings.

b. Excavations are equal to, or greater than, 5 feet deep.

c. Excavations are less than 5 feet deep, but there is a potential for cave-in.

d. When engineering analyses prepared by the Contractor indicate the stability of existing structures and facilities may be jeopardized by settlement or movement of soil.

1.07 GENERAL DESIGN REQUIREMENTS

A. Design excavation support systems to meet requirements and standards of the Occupational Safety and Health Administration (OSHA).

B. Design excavation support systems to meet the requirements of Oregon Administrative Rules, Chapter 437, Division 3, Subdivision P.

C. Design structural steel members in accordance with the American Institute of Steel Construction (AISC) Manual of Steel Construction Allowable Stress Design and the Uniform Building Code.

D. Excavation support systems for trench excavations shall be selected by the Contractor based on the soil and rock conditions, depths of trench excavations, groundwater conditions and other site conditions. No attempt has been made by Engineer to define acceptable trench shoring options.

E. Excavation support systems for structural excavations may consist of either driven steel sheet piling or drilled and/or driven soldier beam and lagging systems complying with requirements of this Section. Contractor may select from either specified system.

F. Allowable Deflection: Not more than 1/2-inch at any point on the shoring system.

G. Cantilevered Design Limits:

1. Maximum height of cantilevered shoring above the bottom of the excavation shall not exceed 15 feet.

H. Resistance to Overturning

1. Design soldier piles and sheet piles with sufficient depth below the excavation to:

a. Resist lateral movement or overturning of the pile, and

b. Act as an effective water cutoff to prevent heaving or flow of soil into the excavation.

2. Calculate the required depth of pile below the bottom of the excavation by assuming the soil immediately below the bottom of excavation does not provide passive resistance for a depth of 1.5 times the effective pile diameter.

1.08 DESIGN REQUIREMENTS FOR SOLDIER PILES AND LAGGING

A. Design soldier piles for downward loads including vertical loads from tie back anchors.

B. Flexural Strength of Lagging: In accordance with the Uniform Building Code, but not greater than 1,500 psi.

C. Wales: Use back-to-back structural members.

D. Soil Anchors, Rock Anchors and Deadmen Anchors:

1. Design tie back anchors with a safety factor of not less than 2 times the calculated load from the shoring.

2. When calculating the length of soil anchors needed to resist the load from the shoring, do not include any anchor length within the potential active pressure soil failure zone behind the face of the shoring.

3. Design anchor tie rods for 130 percent of the calculated load from the shoring.

4. When tie rod couplings are used, design anchor tie rods for 150 percent of the calculated load from the shoring.

1.09 GEOTECHNICAL DATA REPORT (GDR)

A. A geotechnical data report has been prepared for this Project and is included with specifications as a supplement for information only. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for design of the excavation support systems.

2. Copies of the GDR are bound separately and are included in the Contract Documents.

1.10 GEOTECHNICAL ENGINEERING REPORT

A. A Geotechnical Engineering Report has also been prepared and it is available if requested. The geotechnical engineering report is not considered part of the Contract Documents.

1.11 PROJECT SPECIFIC DESIGN REQUIREMENTS

A. Design of Excavation Support System

1. Design Groundwater Elevation: Two feet below ground surface elevation.

2. For excavations extending into basalt bedrock the rock can be cut at slopes as steep as vertical.

3. Specialized drilling equipment may be required to pre-drill holes for soldier pile installation within bedrock.

4. Excavation support systems may be required to protect utilities and provide space for access to the site.

1.12 JOB SITE POSTINGS

A. Maintain at least one copy of the protection system design at the job site while the excavation is open in accordance with the requirements of Oregon Administrative Rules, Chapter 437, Division 3, Subdivision P.

1.13 SEQUENCE AND SCHEDULING

A. Do not begin excavations or installation of excavation supports until submittals for excavation support systems have been accepted by the Engineer and until materials necessary for installation are on site.

B. Allow a minimum of 30 calendar days for Engineer's review of submittals for excavation support systems.

C. Do not begin excavations or installation of excavation support systems until initial survey measurements on control points on existing structures and other improvements are obtained to document baseline elevations and locations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel Soldier Beams: ASTM A36, ASTM A690 or ASTM A992.

C. Steel Sheet Piling: ASTM A328, ASTM A572 or ASTM A690; with continuous interlocks.

D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness as determined by design calculations, but not less than 3 inches.

E. Lean Concrete Mix:

1. Controlled Low Strength Material.

2. A mixture of sand, fine aggregate, water and 2 sacks of cement per cubic yard to create a flowable mixture that fills voids.

3. Minimum Compressive Strength: 1500 psi.

F. Sand Cement Grout:

1. Mixture of one part cement, two parts sand, proportioned by volume, admixtures for pressure grouting, and sufficient water to form workable mix.

2. Maximum slump: 4 inches.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prior to beginning installation of the excavation support system, pothole to locate existing buried utilities in the vicinity of the excavation. Survey utilities and compare actual locations to those locations indicated on the Drawings and the Shop Drawings. Determine any areas of conflict and revise the design and layout of the excavation support system to eliminate these conflicts.

3.02 SLOPING AND BENCHING OF EXCAVATED FACES

A. Where structural excavation support systems are not specifically indicated on the Drawings, sloping and benching systems for exposed faces of excavations may be utilized.

B. Construct sloping and benching systems in accordance with Section 31 00 00.

3.03 TRENCHING SUPPORT SYSTEMS

A. Where structural excavation support systems are not specifically indicated on the Drawings, trench support systems consisting of hydraulic jacks and plates, trench shield systems, and other trench protection systems may be utilized.

3.04 SOLDIER BEAMS AND LAGGING

A. Before starting excavation, drive steel soldier beams or install steel soldier beams in pre-drilled holes.

1. Installation of Soldier Beams in Pre-Drilled Holes

a. Diameter of pre-drilled hole: Not to exceed the outside dimensions of the soldier beam.

b. Backfill around soldier beam using a lean concrete mix.

B. Space soldier beams at regular intervals not to exceed allowable flexural strength of the wood lagging. Align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

C. Install wood lagging within flanges of soldier beams as excavation proceeds. Trim excavation as required to install lagging.

D. Install horizontal wales at locations indicated on the shop drawings and secure to soldier beams.

E. Fill voids behind lagging with gravel, lean concrete, or other material acceptable to the Engineer.

3.05 SHEET PILING

A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

3.06 BRACING

A. Locate bracing to clear temporary and permanent work and to allow lowering of material and equipment into the excavation.

B. If necessary to move brace, install new bracing before removing original brace.

C. Install internal bracing when calculations indicate bracing is required to prevent spreading or distortion of braced frames.

D. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.07 INSPECTION

A. Designer of the shoring system is responsible for confirming proper installation of the shoring system. Shoring system designer, or a representative of the designer, shall make site visits to confirm installation is in accordance with the accepted shoring design.

B. Submit letter of proper installation confirming installation is in accordance with the shoring design.

C. Remove at least the top 10 feet of excavation support systems.

D. Remove excavation support and protection systems when backfill can support the remaining open excavation and bear soil and hydrostatic pressures. Remove support and protection systems in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

E. After removal, promptly fill voids resulting from the extraction of shoring with sand-cement grout. Repair or replace adjacent work damaged or displaced by excavation support and protection systems removal.

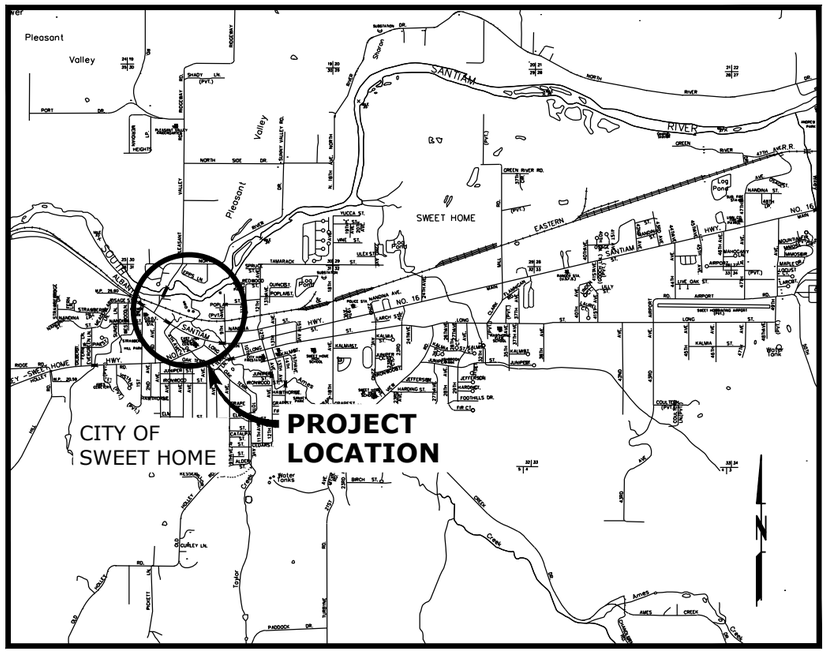
END OF SECTION

Exhibit A

Drawings

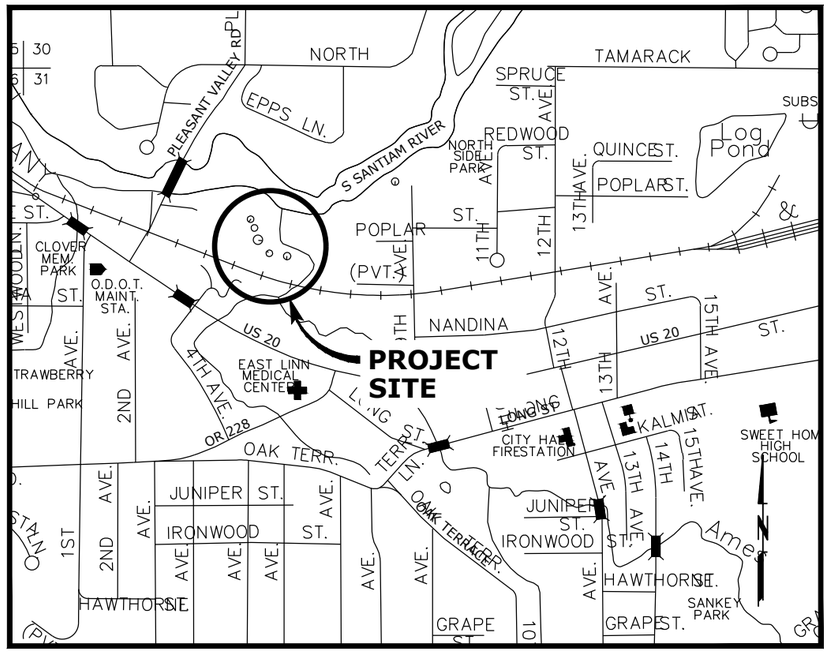
MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN BUILD

DECEMBER 2022



VICINITY MAP

SCALE: 1"=2000'



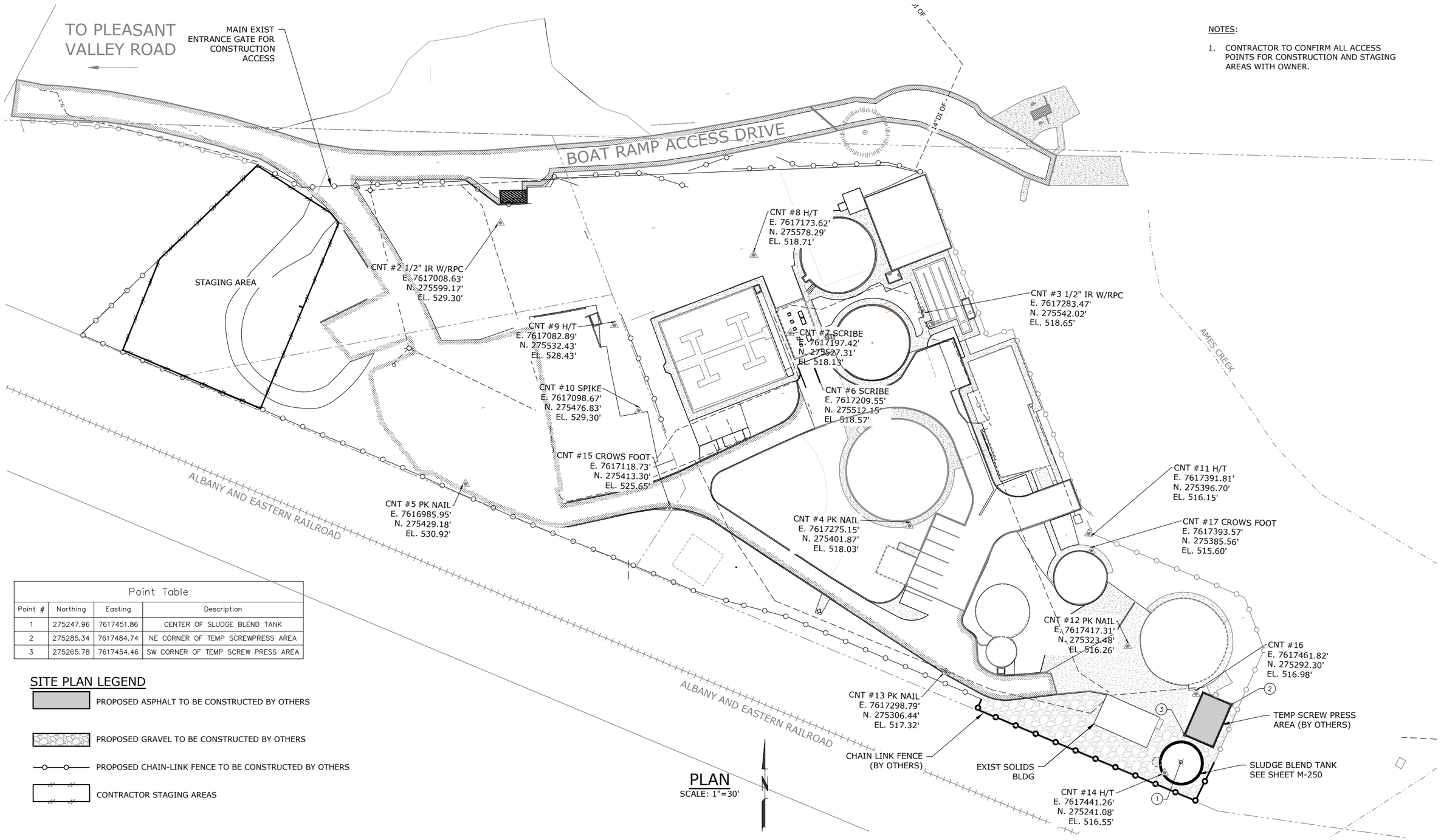
LOCATION MAP

SCALE: 1"=500'

WEST YOST
Water. Engineered.

ATTENTION: OREGON LAW REQUIRES THE CONTRACTOR TO FOLLOW THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. THE CONTRACTOR MAY OBTAIN COPIES OF THE RULES BY CALLING THE UTILITY NOTIFICATION CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-246-6699.)

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NOTES:

1. CONTRACTOR TO CONFIRM ALL ACCESS POINTS FOR CONSTRUCTION AND STAGING AREAS WITH OWNER.

Point Table			
Point #	Northing	Easting	Description
1	275247.96	7617451.86	CENTER OF SLUDGE BLEND TANK
2	275285.34	7617484.74	NE CORNER OF TEMP SCREWPRESS AREA
3	275265.78	7617454.46	SW CORNER OF TEMP SCREW PRESS AREA

SITE PLAN LEGEND

- PROPOSED ASPHALT TO BE CONSTRUCTED BY OTHERS
- PROPOSED GRAVEL TO BE CONSTRUCTED BY OTHERS
- PROPOSED CHAIN-LINK FENCE TO BE CONSTRUCTED BY OTHERS
- CONTRACTOR STAGING AREAS

PLAN
SCALE: 1"=30'

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

BVB DESIGNED
BVB DRAWN
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Sweet Home
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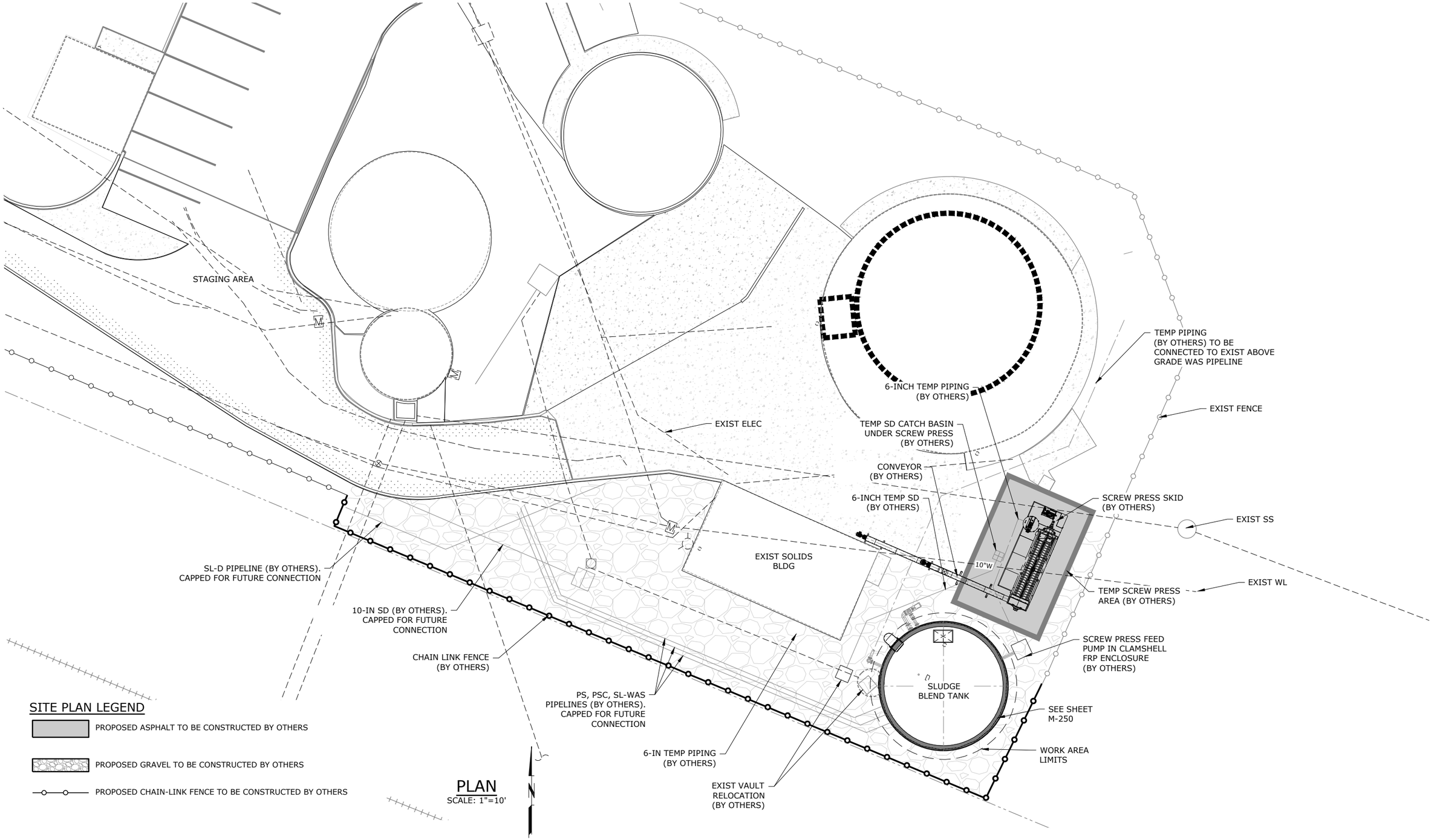
MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

OVERALL SITE PLAN, STRUCTURE COORDINATES, STAGING AND ACCESS, SURVEY CONTROL POINTS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: DECEMBER 2022

SHEET
C-010
XX of XX

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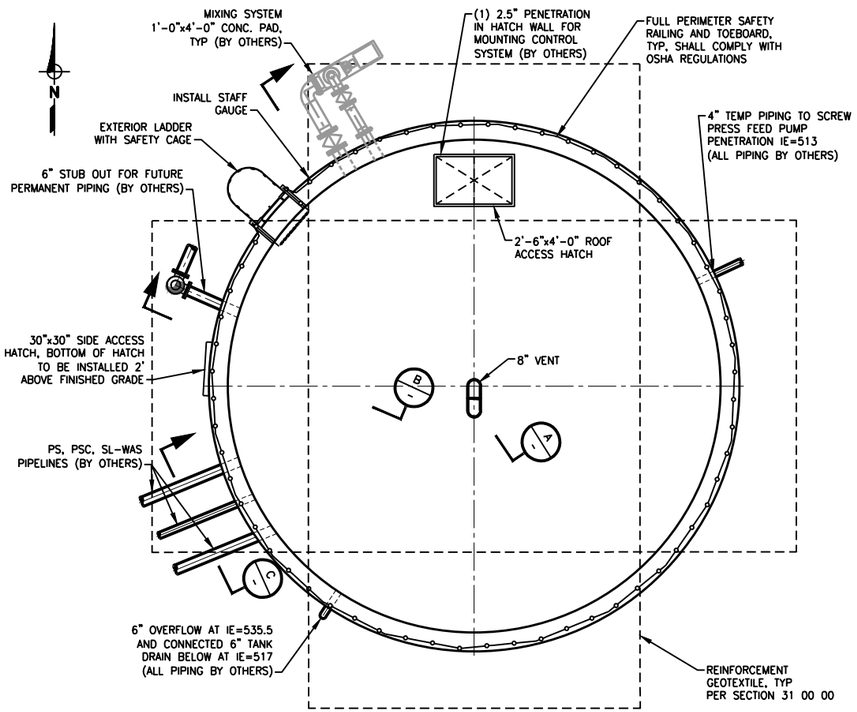
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RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

SOLIDS AREA DETAIL PLAN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: DECEMBER 2022

SHEET
C-020
3 of XX

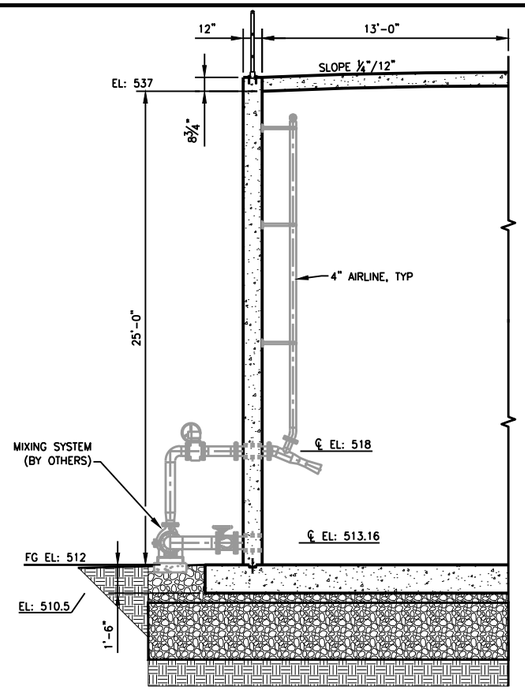
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SLUDGE BLEND TANK

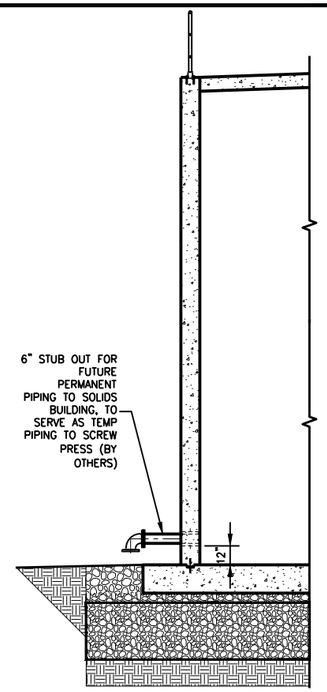
PLAN

SCALE: 1/4"=1'-0"



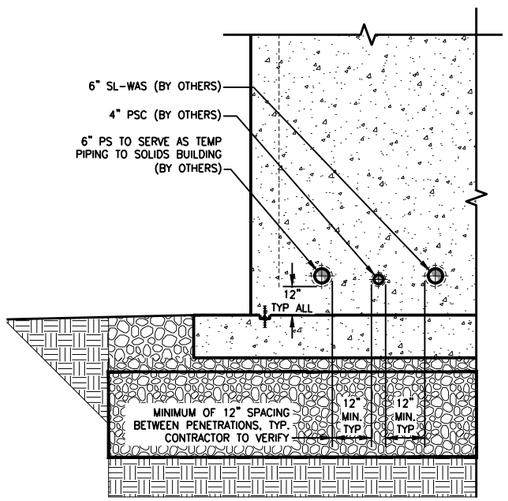
SECTION A

SCALE: 1/4"=1'-0"



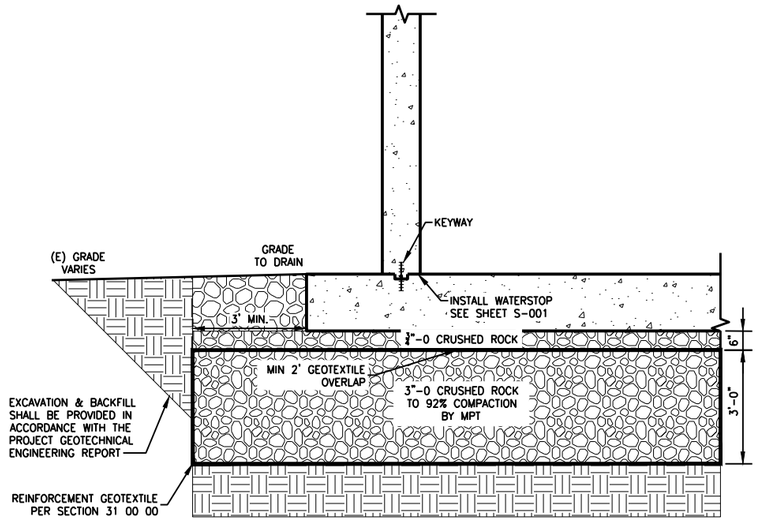
SECTION B

SCALE: 1/4"=1'-0"



SECTION C

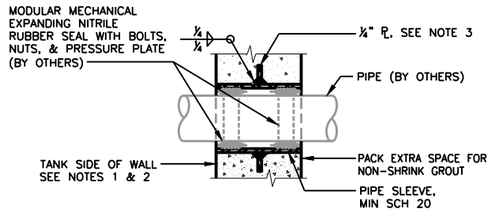
SCALE: 3/8"=1'-0"



TYPICAL BURIED TANK SECTION

DETAIL 1

NOT TO SCALE



TANK WALL PIPE PENETRATION (DOUBLE LINK SEAL)

DETAIL 2 TYP

NOT TO SCALE

NOTES:

1. SLEEVE DIAMETER SHALL BE AS RECOMMENDED BY THE MECHANICAL SEAL MANUFACTURER.
2. SLEEVE NOT REQUIRED FOR PENETRATION IN EXISTING WALLS.
3. WEEP RINGS SHALL HAVE A MINIMUM DIAMETER EQUAL TO THE PIPE OR PIPE SLEEVE OUTSIDE DIAMETER PLUS 3-INCHES.
4. "TANK SIDE OF WALL" SHALL MEAN SIDE OF WALL NORMALLY EXPOSED TO LIQUID, EARTH, OR OUTSIDE ATMOSPHERE.
5. SEAL WITH MASTIC SEALANT WHERE WALL IS EXPOSED TO LIQUID, EARTH, OR EXPLOSION HAZARD AREA.

NO.	DATE	BY	REVISION

NOTICE

0 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

EMR DESIGNED

SMB DRAWN

TRB CHECKED

PRELIMINARY ONLY

DO NOT USE FOR CONSTRUCTION

DEC 2022

West Yost

WEST YOST

Water. Engineered.

Sweet Home Oregon as it's best!

MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

SLUDGE BLEND TANK AND MIXING SYSTEM
PLAN, SECTIONS AND DETAILS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: DECEMBER 2022

SHEET

M-250

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P:\Clients\936 City Of Sweet Home\50-21-09 WWTP Phase 1 Final Design\CAD\Production\Sludge Blend Tank DB\93650-2109-M-250.dwg M-250 12/16/2022 10:22 AM ERODRIGUEZ 23.1s (LMS Tech)

SPECIAL INSPECTIONS:

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD
OSSC TABLE 1705.6, SOILS:			
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.		X	
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.		X	
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.		X	
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X		
5. PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.		X	
OSSC TABLE 1705.3, CONCRETE CONSTRUCTION:			
1. INSPECT REINFORCEMENT AND VERIFY PLACEMENT.		X	OSSC 1908.4
2. REINFORCING BAR WELDING: A. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706. B. INSPECT SINGLE PASS FILLET WELDS, MAXIMUM 5/16". C. INSPECT ALL OTHER WELDS.	 X	 X X	
3. INSPECT ANCHORS CAST IN CONCRETE.		X	
4. INSPECT ANCHORS POST INSTALLED IN HARDENED CONCRETE MEMBERS. A. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS. B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.A.	 X	 X	
5. VERIFY USE OF REQUIRED MIX DESIGN.		X	OSSC 1904.1, 1904.2 1908.2, 1908.3
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS AND DETERMINE THE TEMPERATURE OF THE CONCRETE. COLLECT A MINIMUM OF 6 TEST CYLINDERS FOR EACH POUR ON EACH DAY & EVERY 50 CY POURED.	X		OSSC 1908.10
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X		OSSC 1908.6, 1908.7 1908.8
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.		X	OSSC 1908.9
9. INSPECT PRESTRESSED CONCRETE FOR: A. APPLICATION OF PRESTRESSING FORCES. B. GROUTING OF BONDED PRESTRESSING TENDONS.	 X X		
10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.		X	
11. VERIFY IN-SITU CONCRETE STRENGTH PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.		X	
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.		X	

NOTE: SPECIAL INSPECTION SHALL BE PROVIDED FOR ALL STRUCTURAL ELEMENTS REQUIRING SPECIAL INSPECTION REGARDLESS OF WHETHER THE WORK IS PERFORMED ONSITE OR OFFSITE (SHOP).

CONTRACTOR RESPONSIBILITIES

CONTRACTOR RESPONSIBILITIES: THE CONTRACTOR IS RESPONSIBLE FOR CARRYING OUT THE REQUIREMENTS OF THESE DOCUMENTS THROUGH THE USE OF THEIR OWN EFFORTS OR THAT OF SUB-CONTRACTORS.

THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION METHODS, TECHNIQUES, SEQUENCING AND SAFETY REQUIRED TO COMPLETE THE WORK. ALL INSTRUCTIONS CONTAINED IN THESE DOCUMENTS ARE INTERPRETED TO BE INSTRUCTIONS TO THE CONTRACTOR AND ARE THE RESPONSIBILITY OF THE CONTRACTOR TO FULFIL.

VERIFY EXISTING CONDITIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. IMMEDIATELY BRING DISCREPANCIES TO THE ATTENTION OF THE ENGINEER OF RECORD (EOR).

MEASURE DIMENSIONS OF ANY EXISTING STRUCTURES ASSOCIATED WITH THE WORK AND COORDINATE WITH REQUIRED DIMENSIONS FOR NEW CONSTRUCTION. DRAWINGS SCALES ARE INDICATED FOR REFERENCE TO ASSIST WITH CLARIFYING THE WORK AND PROVIDING PROPORTIONS THAT RESEMBLE ACTUAL CONDITIONS. DO NOT MEASURE DRAWINGS FOR CONSTRUCTION. USE TEXT DIMENSIONS PROVIDED. REQUEST UNKNOWN DIMENSIONS FROM THE ENGINEER WITH SUFFICIENT LEAD TIME TO PREVENT CONSTRUCTION DELAYS. FIELD VERIFY DIMENSIONS.

ARRANGE FOR AND COORDINATE WORK BY TRADES AND SUPPLIERS. FACILITATE REQUIRED INSPECTIONS, SPECIAL INSPECTIONS AND TESTS SPECIFIED BY THE CONTRACT DOCUMENTS, BUILDING CODE AND PERMIT. WHERE COVERINGS OR WORK CONCEALS ITEMS OR AREAS TO BE INSPECTED PRIOR TO SATISFACTORY APPROVAL THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND REPLACEMENT OF COVERINGS OR WORK AS NECESSARY WITHOUT COST TO THE OWNER OR ENGINEER OF RECORD.

THE STRUCTURES SHALL BE FULLY BRACED FOR WIND AND SEISMIC LOADS DURING CONSTRUCTION. THE CONTRACTOR SHALL BRACE THE WORK UNTIL THE PERMANENT LATERAL FORCE RESISTING SYSTEM IS COMPLETED.

INSTALL ITEMS MANUFACTURED OR SUPPLIED BY OTHERS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

WHERE DETAILS OF CONSTRUCTION ARE NOT EXPLICITLY SHOWN, PROVIDE MATERIALS AND CONSTRUCTION OF THE SAME TYPE AND CHARACTER AS THAT OF SIMILAR CONDITIONS USED ON THE PROJECT. THE ACTUAL DETAILS USED SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING MATERIALS OR BEGINNING CONSTRUCTION.

ANY CONFLICT OR DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD FOR CLARIFICATION AND RESOLUTION PRIOR TO ORDERING MATERIALS OR BEGINNING CONSTRUCTION.

STRUCTURAL MATERIAL NOTES

CONCRETE: ALL CONCRETE TANKS, BASINS, AND CONTAINMENT STRUCTURES ARE WATER-BEARING. WATER-BEARING CONCRETE STRUCTURES, INCLUDING REINFORCING, SHALL COMPLY WITH ACI 350, CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES AS WELL AS ACI 318 AND ACI 301 CURRENT EDITIONS. ALL OTHER CONCRETE CONSTRUCTION, INCLUDING REINFORCING, SHALL COMPLY WITH ACI 350, ACI 318 AND ACI 301 CURRENT GOVERNING EDITIONS.

CONCRETE SHALL BE READY MIXED IN ACCORDANCE WITH ASTM C94.

CONCRETE STRENGTHS SHALL BE VERIFIED BY STANDARD 28-DAY CYLINDER TESTS PER ASTM C39, AND SHALL BE AS FOLLOWS:

f'c	MAX W/C	MIN CEMENT	SLUMP	USE
4500 PSI	0.48	590 LBS	4"+/-1"	WATER BEARING STRUCTURES

MIX DESIGNS FOR WATER BEARING STRUCTURES SHALL INCLUDE A CRYSTALLINE WATERPROOFING ADMIXTURE.

CEMENT SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION FOR PORTLAND CEMENT AND CONFORM TO ASTM C150, TYPE II.
FLY ASH CONFORMING TO ASTM C618, TYPE F OR TYPE C. SHALL BE USED TO REPLACE AT LEAST 10% AND UP TO 50% OF THE CEMENT CONTENT, PROVIDED THAT THE MIX STRENGTH IS SUBSTANTIATED BY TEST DATA.
COARSE AGGREGATE SHALL CONFORM TO ASTM C33 WITH A MAXIMUM SIZE OF 3/4".
FINE AGGREGATE SHALL BE CLEAN, DURABLE, NATURAL SAND CONFORMING TO ASTM C33.

A WATER-REDUCING ADMIXTURE CONFORMING TO ASTM C494, USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, SHALL BE INCORPORATED IN CONCRETE DESIGN MIXES. A HIGH-RANGE WATER-REDUCING ADMIXTURE CONFORMING TO ASTM C494, TYPE F OR G, MAY BE USED IN CONCRETE MIXES, PROVIDING THAT THE SLUMP DOES NOT EXCEED 8".
SLUMP AT POINT OF TRUCK DISCHARGE SHALL NOT EXCEED THAT INDICATED ABOVE. SUPERPLASTICIZED CONCRETE SLUMP SHALL NOT EXCEED 7" ±1".

AN AIR ENTRAINING ADMIXTURE CONFORMING TO THE LATEST REVISION OF ASTM C260 SHALL BE ADDED TO CONCRETE TO PROVIDE 4% ±1.5% ENTRAINED AIR FOR SLABS, WALKS AND CURBS EXPOSED TO WEATHER.

LOCATION OF ALL CONSTRUCTION, CONTRACTION, AND EXPANSION JOINTS SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER. PLACE CONSTRUCTION JOINTS IN SLABS AND BEAMS AT THE SAME TIME AND LOCATION. CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED AND INTENTIONALLY ROUGHENED FOR BOND. PROVIDE WATER STOPS IN ALL CONSTRUCTION JOINTS IN WATER BEARING SLABS AND WALLS.

EMBEDDED ITEMS SHALL BE FIRMLY HELD INTO POSITION IN THE FORMWORK AND SHALL NOT BE "WET STABBED" INTO FRESHLY PLACED CONCRETE OR GROUT.

EXPANSION JOINTS SHALL HAVE EDGES ROUNDED TO 1/4" RADIUS, USE 1/2" CORK OR CANE-FIBER FORM BOARD, EXCAVATED TO 1/2" DEPTH AND FILLED WITH AN APPROVED POLY-SULFIDE CAULK.

DO NOT PLACE ANY CONCRETE WHOSE TEMPERATURE IS ABOVE 90°F.

DO NOT PLACE ANY CONCRETE THAT IS MORE THAN 90 MINUTES OLD, SINCE BATCH TIME.

UNLESS SELF-CONSOLIDATING CONCRETE IS APPROVED AS SUCH, ALL CONCRETE SHALL BE CONSOLIDATED DURING PLACEMENT. CONSOLIDATION SHALL BE BY INTERNAL VIBRATION, USING A GASOLINE-POWERED OR PLUG-IN VIBRATOR. INSERT VIBRATOR VERTICALLY INTO THE CONCRETE AT A SPACING NOT EXCEEDING 1.5 TIMES THE RADIUS OF INFLUENCE. DO NOT USE VIBRATOR TO MOVE CONCRETE. EXCEPTIONS TO THE ABOVE MAY BE MADE AS FOLLOWS:
A) SLABS ON GRADE LESS THAN 8" THICK, MAY BE CONSOLIDATED BY TAMPING WITH A COMMERCIAL TAMPER ONLY IF THE CONCRETE SLUMP IS 3" OR LESS.
B) CURBS 6" OR LESS IN WIDTH AND 12" OR LESS IN HEIGHT MAY BE CONSOLIDATED BY BATTERY-POWERED VIBRATOR OR BY MANUAL RODDING.

HYDRAULIC TESTING OF CONCRETE WATER-RETAINING STRUCTURES (INCLUDING CHEMICAL CONTAINMENT STRUCTURES), SHALL BE PER ACI 350.1-10, WITH A MAXIMUM LOSS OF 0.0125% / DAY AS THE QUANTITATIVE CRITERION. THE ENGINEER OF RECORD SHALL WITNESS ALL QUANTITATIVE AND QUALITATIVE TESTING AND APPROVE THE WATERTIGHTNESS OF THE TANK PRIOR TO BACKFILL

SLEEVES, OPENINGS, CONDUIT, AND OTHER EMBEDDED ITEMS NOT SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE APPROVED BY THE STRUCTURAL ENGINEER BEFORE POURING. NO SLEEVE, OPENING, OR INSERT MAY BE PLACED IN BEAMS, JOISTS, OR COLUMNS UNLESS APPROVED BY THE ENGINEER. CONDUITS EMBEDDED IN SLABS SHALL NOT BE LARGER IN OUTSIDE DIMENSION THAN ONE THIRD OF THE THICKNESS OF THE SLAB AND SHALL NOT BE SPACED CLOSER THAN THREE DIAMETERS ON CENTER.
PROVIDE 3/4" CHAMFERS ON ALL EXPOSED CONCRETE EDGES, UNLESS NOTED OTHERWISE. WHERE INDICATED OR REQUIRED, SLOPE CONCRETE SLABS TO DRAINS SHOWN ON PLUMBING AND/OR ARCHITECTURAL DRAWINGS.

ALL CONCRETE SHALL BE CURED IMMEDIATELY AFTER FINISHING OPERATIONS, FOR A PERIOD OF AT LEAST 7 CONSECUTIVE CALENDAR DAYS.

WEATHER RESISTANCE: ALL CONCRETE EXPOSED TO CHLORIDES SHALL CONTAIN A CALCIUM-NITRITE BASED CORROSION-INHIBITING ADMIXTURE DURING THE BATCHING PROCESS. THE DOSAGE FOR CONCRETE EXPOSED TO AIRBORNE CHLORIDES SHALL BE MINIMUM TWO GALLONS PER CUBIC YARD. THE WATER CONTAINED IN THE CORROSION-INHIBITING ADMIXTURE SHALL BE USED IN THE CALCULATION OF THE WATER-TO-CEMENTITIOUS RATIO OF THE CONCRETE. PROVIDE RHEOCRETE CNI BY MASTER BUILDERS OR APPROVED EQUIVALENT.

SHORING AND RESHORING: SHORING AND RESHORING SHALL CONFORM TO ACI 347-01. SHORING AND SUPPORTING FORMWORK SHALL NOT BE REMOVED FROM HORIZONTAL MEMBERS BEFORE CONCRETE STRENGTH IS AT LEAST 70 PERCENT OF DESIGN STRENGTH, AS DETERMINED BY FIELD CURE CYLINDERS. IN ADDITION, SHORING SHALL NOT BE REMOVED SOONER THAN RECOMMENDED BY ACI 347-01 , SECTION 3.7.2.3. FORMWORK SHALL NOT BE REMOVED IN LESS THAN TEN (10) DAYS.

REINFORCING STEEL: ALL REINFORCING BARS SHALL BE GRADE 60 DEFORMED BARS CONFORMING TO ASTM A706 OR A615.
REINFORCING STEEL TO BE WELDED OR FIELD BENT SHALL CONFORM TO ASTM A706.
WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185, UNLESS OTHERWISE NOTED.
REINFORCING STEEL SHALL BE SECURELY TIED IN PLACE WITH #16 ANNEALED IRON WIRE.

ALL DETAILING AND ACCESSORIES SHALL CONFORM TO ACI DETAILING MANUAL SP-66. PROVIDE CHAIRS, SPACERS, BOLSTERS, AND ITEMS IN CONTACT WITH FORMS WITH HOT-DIP GALVANIZED LEGS OR PLASTIC LEGS. ACCURATELY POSITION, SUPPORT, AND SECURE REINFORCEMENT AGAINST DISPLACEMENT BY FORMWORK CONSTRUCTION OR CONCRETE PLACEMENT OPERATIONS. "WET-STICKING" OF REINFORCING IS PROHIBITED.

REQUIRED CONCRETE COVER FOR REINFORCING STEEL (UNLESS NOTED OTHERWISE):

WATER RETAINING STRUCTURES:	
CONCRETE PLACED AGAINST EARTH	3"
OTHER FORMED OR FINISHED SURFACES	2"
OTHER CONCRETE	
FOOTINGS	3" BOTTOM, 2" TOP & SIDES
SLABS	3/4" MINIMUM
COLUMNS	1½" TO TIES, 2" TO PRINCIPLE REINFORCEMENT
BEAMS	1½" TO STIRRUPS, 2" TO PRINCIPLE REINFORCEMENT
WALLS	1½" TO DRY CONDITIONS, 2" TO EARTH, WATER OR WEATHER

LAP SPLICE CONTINUOUS VERTICAL OR HORIZONTAL BARS IN CONCRETE MEMBERS IN ACCORDANCE WITH ACI 318-19, FOR CLASS "B" TENSION LAP SPLICES OR ACI 350 WHICHEVER IS GREATER. DO NOT SPLICE CONTINUOUS TOP BARS IN BEAMS AT ENDS OF CLEAR SPANS. DO NOT SPLICE CONTINUOUS BOTTOM BARS IN BEAMS IN CLEAR SPANS BETWEEN SUPPORTS. AT CYLINDRICAL WALLS, HOOP REINFORCEMENT SPLICES SHALL BE STAGGERED BY NOT LESS THAN ONE LAP LENGTH OR 3 FEET, AND SHALL NOT COINCIDE IN VERTICAL ARRAYS MORE FREQUENTLY THAN EVERY THIRD BAR.
SHOW ALL SPLICES ON SHOP DRAWINGS. SPLICE LOCATIONS AND METHODS SUBJECT TO APPROVAL OF ENGINEER OF RECORD.

AT SLAB AND WALL OPENINGS PROVIDE A MINIMUM OF (2) #5 BARS ALL FOUR SIDES AND DIAGONALLY; EXTEND THESE BARS A LAP DISTANCE OR A MINIMUM OF 27" PAST THE OPENING OR HOOK BARS IF DISCONTINUOUS.

DOWEL ALL WALLS AND COLUMNS TO FOOTINGS WITH HOOKED BAR SIZE AND SPACING TO MATCH VERTICAL REINFORCING UNLESS OTHERWISE SHOWN.

BARS SHALL BE FREE OF LOOSE SCALE, DIRT, GREASE OR ANY OTHER SUBSTANCES THAT IMPAIR THE BOND BETWEEN CONCRETE AND REINFORCING BARS.

CONCRETE ACCESSORIES:
WATERSTOPS SHALL BE INSTALLED IN ALL CONSTRUCTION JOINTS AND SHALL BE SPLICED IN ACCORDANCE WITH THE WATERSTOP MANUFACTURER'S RECOMMENDATIONS. PROVIDE GREENSTREAK #703 OR APPROVED EQUAL.

HEADED SHEAR STUDS SHALL BE NELSON HEADED ANCHORS WITH FLUXED ENDS OR APPROVED EQUAL. DEFORMED BAR ANCHORS (DBA) SHALL BE NELSON, TYPE D2L, OR APPROVED. STUDS AND DBA SHALL BE AUTOMATICALLY END WELDED WITH THE MANUFACTURER'S STANDARD EQUIPMENT IN ACCORDANCE WITH THEIR RECOMMENDATIONS. HAND WELDING NOT PERMITTED.

PERMANENTLY EXPOSED EMBEDDED PLATES AND ANGLES SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION, OR STAINLESS STEEL. ACCURATELY POSITION, SUPPORT, AND SECURE EMBEDDED ITEMS AGAINST DISPLACEMENT BY FORMWORK CONSTRUCTION OR CONCRETE PLACEMENT OPERATIONS. SECURELY ATTACH EMBEDDED ITEMS TO FORMWORK PRIOR TO START OF CONCRETE PLACEMENT. "WET-STICKING" OF EMBEDDED ITEMS IS PROHIBITED. NO LOADS OR WELDS SHALL BE PLACED ON EMBEDDED PLATES OR ANGLES FOR A MINIMUM OF 7 DAYS AFTER CASTING.

WHERE NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE, THE EXISTING CONCRETE SURFACE SHOULD BE CLEANED AND ROUGHENED TO A MINIMUM ¼" AMPLITUDE.

MECHANICAL ANCHORS: MECHANICAL ANCHORS SHALL HAVE A CURRENT ICC-ES EVALUATION REPORT INDICATING CONFORMANCE WITH CURRENT APPLICABLE ICC-ES ACCEPTANCE CRITERIA AC193. MECHANICAL ANCHORS SHALL BE SCREW TYPE OR AS NOTED ON THE DRAWINGS. PROVIDE SPECIAL INSPECTION AS MANDATED BY THE APPLICABLE BUILDING CODE AND BUILDING OFFICIAL HAVING JURISDICTION.

SCREW STYLE ANCHORS SHALL BE ONE PIECE 316 STAINLESS STEEL SCREW ANCHOR WITH FINISHED HEX HEAD WITH INTEGRAL WASHER, DOUBLE LEAD THREAD, CHAMFERED TIP, RATCHET TEETH ON UNDERSIDE OF HEAD. PROVIDE ANCHORS HEAD STAMPED WITH LENGTH. TYPE AND SIZE AS INDICATED ON DRAWINGS. ACCEPTABLE ANCHORS IN 'CRACKED' AND 'UN-CRACKED' CONCRETE ARE SIMPSON TITEN HD (ICC-ES ESR-2713), HILTI KWIK HUS-EZ (ICC-ES ESR-3027) OR POWERS WEDGE BOLT+ (ICC-ES ESR-2526).

IDENTIFY POSITION OF REINFORCING STEEL AND OTHER EMBEDDED ITEMS PRIOR TO DRILLING HOLES FOR ANCHORS. EXERCISE CARE IN CORING OR DRILLING TO AVOID DAMAGING EXISTING REINFORCING OR EMBEDDED ITEMS. NOTIFY THE ENGINEER IF REINFORCING STEEL OR OTHER EMBEDDED ITEMS ARE ENCOUNTERED DURING DRILLING.

ADHESIVE ANCHORS: ADHESIVE ANCHORS SHALL HAVE A CURRENT ICC-ES EVALUATION REPORT INDICATING CONFORMANCE WITH CURRENT APPLICABLE ICC-ES ACCEPTANCE CRITERIA (AC308 FOR INSTALLATION IN CONCRETE OR AC58 FOR INSTALLATION IN MASONRY). ADHESIVE SHALL BE INSTALLED IN DRY HOLES AND HAVE PERFORMANCE DATA FOR INSTALLATIONS IN WATER-SATURATED HOLES. CONTRACTOR SHALL NOTIFY THE ENGINEER-OF-RECORD PRIOR TO INSTALLING ADHESIVE ANCHORS IN WATER-SATURATED (DAMP) HOLES. ADHESIVE SHALL BE FULLY-CURED AT 70°F WITHIN 24 HOURS FROM THE TIME OF INSTALLATION. U.N.O. CONCRETE SHALL BE A MINIMUM OF 21 DAYS OLD AT THE TIME OF INSTALLATION PER ACI 318-14 CHAPTER 17.

ACCEPTABLE FAST CURE ADHESIVE IN 'CRACKED' AND 'UN-CRACKED' CONCRETE ARE SIMPSON AT-XP (IAPMO UES ER-263), HILTI HIT-HY 200 (ICC-ES ESR-3187) OR POWERS AC100+ GOLD (ICC-ES ESR-2582); IN SOLID-GROUTED MASONRY ARE SIMPSON AT-XP (IAPMO UES ER-281) OR HILTI HIT-HY 270 (ICC-ES ESR-4143. DESIGN OF THESE ADHESIVES IS BASED ON CONCRETE TEMPERATURE RANGE 'A' OR '1'.

ACCEPTABLE SLOW CURE ADHESIVE IN 'CRACKED' AND 'UNCRACKED' CONCRETE ARE SIMPSON SET-XP (ICC-ES ESR-2508), HILTI HIT-RE 500-SD (ICC-ES ESR-2322) OR POWERS PE1000+ (ICC-ES ESR-2583); IN SOLID-GROUTED MASONRY ARE SIMPSON SET-XP (IAPMO UES ER-265). DESIGN OF THESE ADHESIVES IS BASED ON CONCRETE TEMPERATURE RANGE 'A' OR '1'.

THREADED STUDS SHALL CONFORM TO ASTM A36, UNLESS NOTED OTHERWISE. PERMANENTLY EXPOSED THREADED STUDS AND THREADED STUDS USED IN WATER BEARING STRUCTURES SHALL BE 316 STAINLESS STEEL. NUTS AND WASHERS SHALL CONFORM TO SAME SPECIFICATION AS THE SUPPLIED ANCHOR RODS.

INSTALLATION SHALL BE IN CONFORMANCE WITH MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS (MPII). INSTALLATION SHALL ALSO INCLUDE BRUSHING AND CLEANING OF DRILLED HOLES WITH COMPRESSED AIR AS REQUIRED BY THE APPLICABLE EVALUATION REPORT. INSTALLERS SHALL BE TRAINED BY THE MANUFACTURER'S REPRESENTATIVE. EMBEDMENT SHALL BE AS INDICATED ON THE STRUCTURAL DRAWINGS.

IDENTIFY POSITION OF REINFORCING STEEL AND OTHER EMBEDDED ITEMS PRIOR TO DRILLING HOLES FOR ANCHORS. EXERCISE CARE IN CORING OR DRILLING TO AVOID DAMAGING EXISTING REINFORCING OR EMBEDDED ITEMS. NOTIFY THE ENGINEER IF REINFORCING STEEL OR OTHER EMBEDDED ITEMS ARE ENCOUNTERED DURING DRILLING.

REINFORCED CONCRETE RESERVOIR

REINFORCED CONCRETE RESERVOIR CONTRACTOR SHALL PROVIDE DESIGN AND CONSTRUCTION OF REINFORCED CONCRETE RESERVOIR WITH CONSIDERATION OF THE STRUCTURAL MATERIALS NOTED HEREIN. REINFORCED CONCRETE RESERVOIR DRAWINGS AND CALCULATIONS SHALL BEAR THE SEAL AND SIGNATURE OF A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF OREGON.
DRAWINGS AND CALCULATIONS SHALL BE SUITABLE FOR OBTAINING A BUILDING PERMIT.
BAKER SLO, LLC., LYNDEN, WA, (360)354-4940 OR APPROVED EQUAL

EXPERIENCE: THE CONTRACTOR RESPONSIBLE FOR DESIGN AND CONSTRUCTION OF THE REINFORCED CONCRETE RESERVOIR SHALL PROVIDE A STATEMENT OF QUALIFICATIONS SHOWING EXPERIENCE OF HAVING DESIGNED AND BUILT A MINIMUM OF TEN SIMILAR REINFORCED CONCRETE RESERVOIRS IN THE LAST FIVE YEAR.

WARRANTY: THE CONTRACTOR RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE REINFORCED CONCRETE RESERVOIR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR AFTER COMPLETION, ACCEPTANCE, TESTING AND FILLING OF THE RESERVOIR.

PLACEMENT OF REINFORCING STEEL: COMPLY WITH ACI 318-LATEST EDITION. LAPS AND SPLICES SHALL BE STAGGERED AND ALL REINFORCING STEEL BE ACCURATELY PLACED. ALL REINFORCING STEEL SHALL BE FIRMLY SECURED TO PREVENT MOVEMENT DURING THE PLACING OF THE CONCRETE.

PLACEMENT OF CONCRETE: PLACE CONCRETE WITHIN 90 MINUTES OF BATCHING. BEFORE EACH POUR THE PREVIOUSLY PLACED CONCRETE SHALL BE THOROUGHLY CLEANED TO REMOVE ALL LOOSE SCALE, OIL AND ANY FOREIGN MATERIAL THAT MAY PREVENT A GOOD BOND WITH THE EXISTING CONCRETE. CONCRETE SHALL NOT BE ALLOWED TO FREE FALL MORE THAN 5 FEET DURING PLACEMENT. DEPOSIT CONCRETE IN HORIZONTAL LAYERS NOT TO EXCEED 18 INCHES IN DEPTH AND PLACE AS CLOSE AS POSSIBLE TO FINAL POSITION TO AVOID SEGREGATION. VIBRATE ALL CONCRETE DURING PLACEMENT WITH HIGH FREQUENCY INTERNAL VIBRATORS AS IT IS PLACED TO THOROUGHLY WORK THE CONCRETE AROUND REINFORCEMENT AND EMBEDDED ITEMS WITHOUT SEPARATION OF AGGREGATE.

FORM REMOVAL: ALLOW WALL FORMS TO REMAIN IN PLACE AT LEAST 16 HOURS AFTER CONCRETE HAS BEEN PLACED UNLESS LOW TEMPERATURES OR POOR WEATHER CONDITIONS REQUIRE MORE CURE TIME. ALLOW ROOF FORMS TO REMAIN IN PLACE FOR A MINIMUM OF 7 DAYS UNLESS LOW TEMPERATURES OR POOR WEATHER CONDITIONS REQUIRE MORE CURE TIME.

CONCRETE FINISHES: BASE SLAB AND ROOF SHALL BE A "WOOD FLOAT" FINISH TO PREVENT SLIPPERY SURFACES. UNDERSIDE OF ROOF SHALL BE ROUGH FORM FINISH. WALLS SHALL BE STEEL FORM FINISH WITH MINIMUM REFINEMENT. ROCK POCKETS, HONEYCOMBS, FORM TIE HOLES AND ANY VOIDS OVER 1/2 INCH DEEP SHALL BE REPAIRED. CONTACT ENGINEER OF RECORD PRIOR TO REPAIRS.

CLEAN AND PRESSURE WASH THE INTERIOR OF THE RESERVOIR AFTER CONSTRUCTION.

TOLERANCES:
BASE SLAB POSITION IN PLAN: +1/2 INCH
BASE SLAB DEPARTURE FROM LEVEL: +1/2 INCH AND -1/2 INCH
WALL DEPARTURE FROM PLUMB OR BATTER: 0.3% X HEIGHT < 1 INCH
VARIATION IN THICKNESS OF SLABS AND WALLS: +1/2 INCH AND -1/4 INCH
DEPARTURE IN LOCATION OF OPENINGS: +1/4 INCH AND -1/4 INCH
ABRUPT IRREGULARITIES (USING A 5' LONG STRAIGHT EDGE): +1/2" & -1/4"

TESTING: FILL THE RESERVOIR TO CHECK FOR WATER TIGHTNESS AFTER A MINIMUM OF 28 DAYS HAS PASSED SINCE THE LAST CONCRETE POUR. CHECK THE WATER LEVEL AFTER 3 CONSECUTIVE 24 HOUR PERIODS. ALLOWING FOR EVAPORATION, THE WATER LEVEL SHALL NOT DROP MORE THAN 1 TENTH OF ONE PERCENT IN ANY 24 HOUR PERIOD.

CRACKING: CRACKS WIDER THAN 0.005 INCHES THAT FORM WITHIN THE WARRANTY PERIOD SHALL BE CLEANED, REPAIRED AND INJECTED BY AN APPROVED EPOXY SEALING SYSTEM OR ADDITIONAL CONCRETE SHALL BE PLACED TO MAINTAIN WATER TIGHTNESS.

WEEPING AND EFFLORESCENCE: ACTIVE LEAKAGE OR EXCESSIVE EFFLORESCENCE THAT OCCURS WITHIN THE WARRANTY PERIOD SHALL BE CLEANED, REPAIRED AND INJECTED WITH AN APPROVED EPOXY SEALING SYSTEM OR ADDITIONAL CONCRETE SHALL BE PLACED TO MAINTAIN WATER TIGHTNESS. EXCESSIVE EFFLORESCENCE IS DEFINED AS EFFLORESCENCE PROJECTING MORE THAN 1/2 INCH FROM THE FINISH CONCRETE SURFACE OR ANY EFFLORESCENCE IN A CONTINUOUS LINE EXCEEDING 10 FEET IN LENGTH.

GENERAL STRUCTURAL NOTES

COORDINATION: CONSULT MECHANICAL DRAWINGS FOR SLEEVES, DEPRESSIONS, PENETRATIONS AND OTHER DETAILS REQUIRED FOR THE REINFORCED CONCRETE RESERVOIR.

CONTRACTOR SHALL LOCATE ALL CONCEALED UTILITIES PRIOR TO EXCAVATION OR SELECTIVE DEMOLITION WORKS. THE ENGINEER OR RECORD SHALL BE NOTIFIED OF POTENTIAL CONFLICTS BETWEEN FOUNDATIONS AND BURIED UTILITIES.

CODE REQUIREMENTS: THE STRUCTURES ARE DESIGNED IN ACCORDANCE WITH THE 2019 OREGON STRUCTURAL SPECIALTY CODE (OSSC) AND REFERENCE DOCUMENTS (ADM, ACI, AISC, AISI, ANSI, APA, ASCE/SEI, ASTM, AWC, AWPA, AWS, ICC, SDI, SJI, TMS, UL, WCLIB, ETC). FOLLOW ALL APPLICABLE PROVISIONS FOR ALL PHASES OF CONSTRUCTION.

TEMPORARY CONDITIONS: THE STRUCTURAL INTEGRITY OF THE COMPLETED STRUCTURE DEPENDS ON INTERACTION OF VARIOUS CONNECTED COMPONENTS. PROVIDE ADEQUATE BRACING, SHORING, AND OTHER TEMPORARY SUPPORTS AS REQUIRED TO SAFELY COMPLETE THE WORK. THE STRUCTURE SHOWN ON THE DRAWINGS HAS BEEN DESIGNED FOR STABILITY UNDER FINAL CONFIGURATION ONLY.

WALLS WHICH TIE TO UPPER SLABS SHALL NOT BE BACKFILLED UNTIL THE UPPER SLABS REACH FULL STRENGTH, UNLESS ADEQUATE BRACING IS PROVIDED AT THE TOP OF THE WALL.

EXISTING CONDITIONS: ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS SHALL BE FIELD VERIFIED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR RECORD OF ANY SIGNIFICANT DISCREPANCIES FROM CONDITIONS SHOWN ON THE DRAWINGS.

EXISTING STRUCTURE: INFORMATION FOR EXISTING STRUCTURES WAS TAKEN FROM RECORD DRAWINGS PROVIDED BY THE CITY OF SWEET HOME. WORK SHOWN ON THESE PLANS ASSUMES THAT THE ORIGINAL CONSTRUCTION WAS PERFORMED IN ACCORDANCE WITH THE ORIGINAL DRAWINGS INCLUDING, BUT NOT LIMITED TO, DIMENSIONS, ELEVATIONS, MEMBER SIZES, MATERIALS, DETAILS, ETC. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE CONDITIONS RELATING TO THE EXISTING STRUCTURES AND TO NOTIFY THE ENGINEER OR RECORD IMMEDIATELY OF ANY DISCREPANCIES OR CONFLICTS.

EXERCISE EXTREME CARE AND CAUTION WHEN EXCAVATING AND FILLING ADJACENT TO EXISTING STRUCTURES. UNDER NO CIRCUMSTANCES SHALL THE STRUCTURAL INTEGRITY OF THE EXISTING STRUCTURES BE IMPAIRED IN ANY WAY BY CONSTRUCTION OPERATIONS AND PROCEDURES. DO NOT EXCAVATE OR DISTURB SOIL ADJACENT TO OR BENEATH EXISTING FOOTINGS.

DESIGN CRITERIA: THE FOLLOWING LOADS AND PARAMETERS WERE USED TO DETERMINE WIND AND SEISMIC LOADS.

VERTICAL LOADS:
DEAD LOADS:
CONCRETE SLABS: 150 PCF DL

GROUND SNOW LOAD: 25 PSF SL

FLOOR LIVE LOADS:
PROCESS 125 PSF LL, 2000 LB CONCENTRATED

LATERAL LOADS:
SEISMIC: RISK CATEGORY 3, SITE CLASS B, S_S=0.63, S_1=0.34, F_a=1.00, F_v=1.00, S_{MS}=0.63g, S_{M1}=0.34g, S_{DS}=0.42g, S_{D1}=0.23g, MCE_R=0.29g, F_{PGA}=1.00, SEISMIC DESIGN CATEGORY=D.

WIND: BASIC WIND SPEED: V=104

Exhibit B

Geotechnical Data Report

City of Sweet Home
Mahler Water Reclamation Facility Improvements

Geotechnical Data Report

Final Submittal

Prepared for

December 2022

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Acronyms and Abbreviations

ASTM	American Society for Testing and Materials
bgs	below ground surface
bpf	blows per foot
GDR	Geotechnical Data Report
$I_{S(50)}$	point load index
LBVS	Little Butte Volcanic Series
MJA	McMillen Jacobs Associates
N-value	standard penetration test blows to advance final foot
OAR	Oregon Administrative Rules
PGA	peak ground acceleration
RQD	Rock Quality Designation
SPT	Standard Penetration Test
USGS	United States Geological Survey
West Yost	West Yost Associates, Inc.
WRF	Wastewater Reclamation Facility

Distribution

To: Preston Van Meter, P.E.
West Yost Associates, Inc.

From: Wolfe Lang, P.E., G.E.
McMillen Jacobs Associates

Prepared By: Jeff Quinn, P.E.
McMillen Jacobs Associates

Reviewed By: Wolfe Lang, P.E., G.E.
McMillen Jacobs Associates

Revision Log

Revision No.	Date	Revision Description
Final Submittal	July 22, 2022	Final Submittal to West Yost
Final Submittal Rev. 1	December 16, 2022	Final Submittal Incorporating Site Revisions

1.0 Introduction

1.1 General

McMillen Jacobs Associates (MJA) has been retained by West Yost Associates, Inc. (West Yost) to provide geotechnical engineering services for the City of Sweet Home Mahler Water Reclamation Facility Improvements project. The project owner is the City of Sweet Home. The Project site location is shown in the Vicinity Map, Figure 1. This Geotechnical Data Report (GDR) presents the results of our field explorations and laboratory testing, as well as a discussion on the site geology.

1.2 Project Description

The City of Sweet Home Mahler Water Reclamation Facility (WRF) is located at 1357 Pleasant Valley Road, in Sweet Home, Oregon. The WRF has been in service since 1947 with two major upgrades completed in 1974 and 1994 (Brown & Caldwell, 2016). Our project understanding is based on our communication with West Yost and the 90 percent submittal plans entitled *Mahler Water Reclamation Facility Improvements Project – Phase 1*, dated June 2022, prepared by West Yost. The proposed WRF improvements are shown in Figure 2.

The proposed WRF improvements include the following:

- *Main Electrical and Blower (MEB) Building*: The 22- by 67.5-foot MEB Building will be located within the north-central part of the WRF site. The interior of the building will be supported on a 6-inch-thick slab on grade foundation, while the perimeter of the structure will be supported on a 1.5-foot-wide continuous spread footing. A new generator, which will be installed on the north side of the MEB Building, will be supported on 12- by 28-foot, 12-inch-thick reinforced concrete slab on grade with thickened edges. Site grades will be raised up to approximately 6 feet in this area to facilitate construction of the MEB Building, with approximately 4 to 6 feet of fill placed below the building footprint. The approximately 6-foot-tall fill slope on the east side of the MEB Building will descend at 2H:1V (horizontal:vertical).
- *Influent Pump Station (IPS)*: The new, 40- by 56-foot IPS will be constructed just north of the existing IPS, within the southeast corner of the WRF site. The approximate southern half of the IPS structure, which supports above-grade piping, will be supported on a 12-inch-thick reinforced concrete slab on grade with thickened edges. The approximate northern half of the IPS structure, which houses five submerged pumps, will be supported on a 28-inch-thick reinforced concrete slab with a base elevation of approximately 491.2 feet (e.g., about 26.2 feet below grade).
- *Sludge Blend Tank*: The new, 28-foot diameter sludge blend tank will be constructed in the southeast corner of the WRF site just east of the solids building. The sludge blend tank will be approximately 25 feet tall and will be supported on a 1.5-foot-thick, reinforced concrete mat foundation with a base elevation of approximately 515.3 feet (e.g., about 1.5 feet below grade).
- *Digested Sludge Holding Tank*: The new, 36-foot diameter sludge blend tank will be constructed in the southeast corner of the WRF site just north of the sludge blend tank. The sludge blend tank

will be approximately 26 feet tall and will be supported on a 1.5-foot-thick, reinforced concrete mat foundation with a base elevation corresponding to approximately 1.5 feet below grade.

- *Solids Building Expansion*: The existing solids building will be enlarged from its existing 22- by 37-foot plan dimensions to approximately 32- by 57-foot plan dimensions and will be supported on a shallow foundation system consisting of perimeter footings and an interior slab-on-grade.
- *40*-foot Diameter Digestor: The new digestor will be constructed within the footprint of the existing, approximately 55-foot diameter digestor (DG1) in the southeast corner of the WRF site. We understand that the existing foundation will be used to support the new digestor structure.
- *Temporary Generator*: A temporary electrical generator, supported on an 18-inch-thick reinforced concrete slab, will be installed on the south side of existing Secondary Clarifier SC60.
- *Existing Bathroom Relocation*: The existing bathroom, currently along the northern fence line and east of the existing entrance gate, will be moved to the north side of the boat ramp access road.
- *Retaining Walls*: To support new fills placed for site grading, as well as proposed cuts, there are six retaining walls (designated Wall 1 through Wall 6) proposed as part of the improvements. The retaining walls will be cast-in-place, reinforced concrete cantilevered walls ranging in height from 2.5 to 6.75 feet.
- *Existing Structures/Facilities to Remain In Use*: Secondary Clarifier Nos. 1 through 3; RAS/WAS Pump Station; Aeration Basin; Chlorine Contact Chamber; Administration and Operations Building; Solids Building; Sand Filters; Lime Silo; and the electrical building on the south side of existing SC60.
- *Proposed Piping Improvements*: 12-inch storm drain;10-inch storm drain; 8-inch to 36-inch sanitary sewer; 12-inch IPS forcemain to headworks (HDPE pipe); 24-inch RS IPS to Headworks (HDPE pipe); 6-inch PS forcemain; 12-inch RDPS; 6-inch SL-WAS; 6-inch SL-D forcemain; 4-inch PSC; and 10-inch DIP waterline relocation.
- *Demolition of the Following Existing Structures*: Backwash Storage; Waste Backwash Storage; the approximately 25- by 50-foot storage building on the west side of the WRF site; and several buildings clustered together in the central portion of the WRF site including the carport, an approximately 40- by 40-foot CMU building, an approximately 25- by 50-foot Quonset Hut storage building, and an approximately 15- by 35-foot shed.
- *Primary Clarifier*: The new primary clarifier will consist of an approximately 65- by 85-foot reinforced concrete tank structure. The base depth of the new primary clarifier will be approximately 9.5 to 22.5 feet below existing site grades and will be supported on an 18-inch-thick, reinforced concrete mat foundation system. The primary clarifier will be expanded to the north (designated Primary Clarifier 4) at a future date.
- *Secondary Clarifier 90 (SC90)*: SC90 will consist of an approximately 95-foot diameter, 17-foot-tall reinforced concrete tank structure. SC90 will be a primarily below-grade structure, with the tank walls being about 2 feet above finish grade. The base depth of the SC90 will be approximately 15 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Building A (O&M and Controls)*: This 40- by 120-foot building, oriented northeast-southwest, will be constructed at the west end of the WRF site and will be an at-grade structure supported on

an interior slab-on-grade. The perimeter of the structure and interior load-bearing walls will be supported on shallow spread footings.

- *Building A (Headworks and Dewatering)*: This 40- by 120-foot building, oriented southeast-northwest, will abut the southeast corner of the O&M and Controls building to form the leg of the L-shaped Building A. This will be an at-grade structure supported on an interior slab-on-grade. The perimeter of the structure and interior load-bearing walls will be supported on shallow spread footings.
- *SC90 WAS and RAS Pump Stations*: Each of these two pump stations will be an approximately 10-foot diameter reinforced concrete vault structure with a base depth of approximately 16.5 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Existing Secondary Clarifier SC60 RAS/WAS Pump Station*: This pump station will be an approximately 10- by 20-foot reinforced concrete vault structure with a base depth of approximately 12.5 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Aeration Basin No. 3*: Aeration Basin No. 3 will consist of an approximately 40- by 75-foot reinforced concrete structure. The base depth of Aeration Basin No. 3 will be approximately 13 to 18 feet below existing site grades and will be supported on a reinforced concrete mat foundation. Aeration Basin No. 3 will be expanded to the north (designated Aeration Basin No. 4) at a future time and will likely be founded at the same depth as Aeration Basin No. 3.
- *Tertiary Filters*: The tertiary filters will be housed in an approximately 25- by 35-foot reinforced concrete tank structure. The base depth of Aeration Basin No. 3 will be approximately 18 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Tertiary Building, UV Disinfection, and UW Storage*: These facilities will be located adjacent to one another within an approximate 35- by 40-foot area. The UW Storage and UV Storage facilities will be constructed within the existing chlorine contact chamber. The portion of the Tertiary Building housing the utility water pumps will likely be approximately 7 feet below existing site grades.
- *Outfall*: The outfall pipe leads from the UV disinfection chamber to the South Santiam River. This will be part of a future project phase.
- *Other Improvements*: The approximate western half of the WRF site, an area north of the boat ramp access drive, and a narrow area along the south site boundary will be surfaced with gravel. New asphalt pavements along the entrance road from Pleasant Valley Road and within most of the WRF site; new concrete curbs and sidewalks; two new entrance gates; and a new chain-link fence.

1.3 Purpose and Scope of Work

The primary purpose of this GDR is to compile sufficient geologic and geotechnical data at the project site to support the design and construction of the proposed improvements. This GDR presents a summary of geologic and geotechnical data collected from field explorations and testing, laboratory testing, a review of published geological sources, and other historical geotechnical information related to the project. Information contained in this GDR will be used to characterize subsurface conditions at the site and to develop recommendations for design and construction of the Project.

2.0 Site Conditions

2.1 Site Description

The existing WRF site is located on the south bank of the South Santiam River near its confluence with Ames Creek. The site is bordered by the Albany and Eastern railroad tracks to the south, a boat ramp access road and the South Santiam River beyond, private property to the west, and Ames Creek to the east. In general, the site slopes gently from the west to the east (i.e., towards Ames Creek) and gently from the south to the north towards the South Santiam River. The eastern two-thirds of the site, where most of the WRF is located, is situated on a relatively level terrace that generally sits 5 to 7 feet lower than the western one-third of the site and approximately 10 feet above Ames Creek to the east.

A paved access road runs along the north side of the site, from the Pleasant Valley Road WRF entrance at the west end of the site to the boat ramp and recreation use area at the north-northeast end of the site that provides public access to the South Santiam River. The paved WRF road, heading south from the access road from the main entrance gate, provides access to the main areas within the WRF. Bedrock is exposed along the South Santiam River and Ames Creek approximately 100 feet to the north-northeast of the site. Exposed bedrock on the riverbank slopes steeply into the river.

2.2 Regional Geology

The project site is located in the foothills of the Western Cascades, a north-south trending physiographic region that stretches from northern California to British Columbia, tucked between the Willamette Valley to the west and the younger High Cascades to the east. The Western Cascades in Oregon were formed by a series of volcanic events from approximately 35 to 17 million years ago. The region is marked by densely forested hills dissected by the region's many rivers (Madin, 1990; Schlicker and Deacon, 1967; Wilson, 1998; Popowski, 1996).

The Paleogene structural basement of this region of the Western Cascades is composed of non-marine volcaniclastic sedimentary rocks, tuff, basaltic andesite, andesite, and dacite of the Late Eocene to Oligocene Fisher Formation. The Fisher Formation is overlain by basalt lavas, ash-flow tuff, tuff, and non-marine sedimentary rocks of the Little Butte Volcanic Series. A subducting plate below the Eocene shoreline resulted in a volcanic chain that produced the volcanic activity responsible for the Fisher Formation and the Little Butte Volcanic Series. As the angle of the subducting plate shifted, the volcanic activity gradually shifted east of the region. The bedrock in the project area is composed of tholeiitic basalt from the Little Butte Volcanic Series.

Over the span of geologic time, quaternary sedimentary deposits of alluvium, colluvium, landslide deposits, and terrace deposits have accumulated on the volcanic rock surfaces and in the valleys formed by the rivers. The sediments that directly overlie the bedrock in the project area have been defined as alluvium. Regionally, the alluvium consists of unconsolidated gravel, sand, silt, and clay deposited in modern stream channels, adjoining flood plains, overbanks, and low bedrock terraces.

Across the project area, fill materials are present near the ground surface. These materials were generally placed to re-grade the site prior to development.

3.0 Site Investigations

3.1 General

The subsurface exploration was completed in four phases, between 2018 and 2022, and consisted of five boreholes (designated B-1 through B-5) and 36 probe-holes (designated P-01 through P-36).

The site investigations were performed under the direction of a geologist or geotechnical engineer from MJA, who examined and logged the soil and rock conditions encountered in the borings. The soils were classified in the field in accordance with the Visual-Manual Procedure (ASTM D 2488). Sample depths, stratigraphy, groundwater occurrence and soil engineering characteristics were also recorded. The stratigraphic contacts indicated on the logs represent the approximate boundaries between soil and rock; actual transitions may be more gradual. The boring logs are presented in Appendix A. The soil and rock samples were transported to the MJA Portland office for further examination. The rock core samples were transported, stored, cataloged, and disposed of in accordance with the Standard Practices for Preserving and Transporting Rock Core Samples (ASTM D 5079). The rock core photos are included in Appendix B

3.2 Exploratory Borings

Phase one was completed between April 30 and May 2, 2018, and included the advancement of five boreholes (B-1 through B-5) and fifteen probe-holes (P-01 through P-15). The Phase one borings were completed by Western States Soil Conservation (WSSC) of Hubbard, Oregon using a truck-mounted CME-75 drill rig. The boreholes were advanced to depths ranging from 5.8 to 23 feet bgs using mud-rotary drilling techniques within soil materials, and HQ-triple-tube wireline coring in rock materials in accordance with ASTM D 2113. The probe-holes were advanced using hollow-stem auger drilling techniques and extended to depths ranging from 2.5 to 15 feet bgs at which point drilling refusal was encountered at the top of the bedrock surface.

Phase two was completed on October 29, 2019 and consisted of the advancement of 12 probe-holes (designated P-16 through P-27). The phase two probe-holes were completed by McCallum Rock Drilling of Salem, Oregon using a track-mounted Furakawa 900 drill rig. The probe-holes were advanced to depths ranging from 11 to 26 feet bgs using air percussion drilling methods.

Phase three was completed on June 20, 2022 and consisted of eight probe-holes (designated P-28 through P-35) advanced by PLI Systems of Hillsboro, Oregon using a truck-mounted Mobile B-75 drill rig. The probe-holes were advanced using hollow-stem auger drilling techniques and extended to depths ranging from 3.7 to 19 feet bgs.

Phase four was completed on November 22, 2022 and consisted of one probe-hole (designated P-36) advanced by WSSC using a truck-mounted CME-75 drill rig. P-36 was advanced using hollow-stem auger drilling techniques and extended to 11.5 feet bgs.

In borings B-2 through B-5 and probe-holes P-28 through P-36, disturbed soil samples were collected in conjunction with a SPT at selected intervals using a standard 2-inch diameter split-barrel sampler, and automatic safety hammer system. In each test, the sampler was advanced 18 inches by dropping the 140-

pound hammer a distance of 30 inches for each strike in accordance with ASTM D 1586. The number of hammer blows for each six inches of penetration was recorded. The standard penetration resistance (N-value) of the soil is calculated as the sum of the number of blows required for the final 12 inches of sampler penetration. The SPT N-values of greater than 50 blows per six inches of penetration is referred to as refusal. The N-value is an indication of the relative density of granular soils and the relative consistency of cohesive soils. Uncorrected N-values are presented on the boring logs. In addition to the SPT sampling, relatively undisturbed samples were obtained in selected borings by pushing a 3-inch inside diameter thin wall sampler (Shelby Tube) in accordance with ASTM D 1587.

In the probe-holes in which SPT sampling was not performed, soil samples were taken from borehole cuttings. These sampling locations are shown in boring logs.

3.3 Piezometers

Two-inch diameter piezometers were installed in two boreholes to allow for long-term, stabilized groundwater level measurements. Piezometers were installed in the following boreholes:

- Boring B-3, screened between 9 and 12 feet bgs.
- Boring B-5, screened between 5.5 and 8.5 feet bgs.

3.4 Borehole Backfill and Abandonment

Piezometer construction and borehole backfilling and abandonment was performed in accordance with the requirements of the Oregon Department of Water Resources (OAR 690-240, Construction, Maintenance, Alteration, Conversion, and Abandonment of Monitoring Wells, Geotechnical Holes, and Other Holes in Oregon).

4.0 Laboratory Testing

Field samples obtained from exploratory borings were delivered to the MJA Portland office for further examination and storage. Each of the samples was re-examined and compared to the field boring log description to confirm the field classifications and maintain consistency. Representative samples were then selected for laboratory testing. Testing was performed on soil and rock samples from boreholes B-1, B-3, and B-5. The laboratory test results are provided in Appendix B. The laboratory testing included the following index and strength property tests, performed in accordance with relevant ASTM standards:

- Moisture content analyses (ASTM D 2216).
- Atterberg limits tests (ASTM D 4318).
- Point load tests of rock core (ASTM D 5731).
- Unconfined compressive strength of intact rock core (ASTM D 7012).

Point load testing was performed by MJA. All other laboratory testing was performed by Northwest Testing, Inc. of Wilsonville, Oregon. Laboratory test results are presented in Appendix B. A summary of the laboratory test results is provided in Table 4-1 on the following page. Comprehensive laboratory test results are presented in Appendix C.

Table 4-1. Laboratory Test Results Summary

Sample Location or ID				Soil Description			Moisture %	Atterberg Limits			Strength Testing		
											Point Load Strength Index, PLI	PLI Test Type	UCS[1]
Boring	Sample, No.	Top Depth (feet)	Bottom Depth (feet)	Geologic Unit	USCS Soil Type	Soil or Rock Description		Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Corrected Point Load Strength Index, $I_{s(50)}$ (PSI)	Diametral or Axial	PSI
B-1	R-1	5.2	6.3	LBVS Basalt		BASALT							25,302
B-3	S-2	5	6.5	FILL	CH	SANDY FAT CLAY	44.8	51	28	23			
B-5	S-1	2.5	4	FILL	SM	SILTY SAND with Gravel	26.3	44	28	16			
B-5	R-1	11.7	12.4	LBVS Basalt		BASALT							29,919
B-5	R-2	18.0	19.0	LBVS Basalt		BASALT							6,932
B-5	R-2	16.8	17.2	LBVS Basalt		BASALT					513	Diametral	12,563[2]
B-5	R-2	16.3	16.8	LBVS Basalt		BASALT					304	Diametral	7,437[2]
B-5	R-2	16.8	17.0	LBVS Basalt		BASALT					653	Diametral	13,717[2]
B-5	R-2	17.2	18.0	LBVS Basalt		BASALT					268	Diametral	5,098[2]
B-5	R-2	17.6	18.0	LBVS Basalt		BASALT					569	Diametral	13,951[2]
B-5	R-3	22.5	23.0	LBVS Basalt		BASALT					579	Diametral	13,315[2]
B-5	R-1	9.0	9.5	LBVS Basalt		BASALT					407	Diametral	9,778[2]
B-5	R-2	12.4	12.8	LBVS Basalt		BASALT					714	Diametral	17,138[2]
B-5	R-2	15.8	16.7	LBVS Basalt		BASALT					383	Diametral	9,185[2]
B-5	R-2	16.3	16.7	LBVS Basalt		BASALT					690	Diametral	14,493[2]

[1] UCS = Unconfined compressive strength.
[2] UCS results from point load strength index testing are based on a correlation factor of 24.5, which was calculated by plotting the relationship between UCS and point load strength index test results.

5.0 Subsurface Conditions

The materials encountered in the explorations were grouped into three geotechnical units: Pavement, Fill, Boulders, and Basalt (Little Butte Volcanic Series – Tholeiitic Basalt). These units have been defined by their geologic origin, stratigraphic position, engineering properties, and their distribution in the subsurface. Variations in subsurface conditions may exist between the locations of the borings. Contacts between the units may be more gradational than shown in the boring logs in Appendix A. The SPT N-values, shown on the boring logs and discussed below, are reported as counted in the field (uncorrected). Photos of rock core samples are provided in Appendix C. Cross sections of subsurface conditions are shown in Figures 3A through 3F. The following sections describe each geotechnical unit in greater detail.

5.1.1 Pavement

Asphalt concrete (AC) pavement was encountered in 12 borings (P-01, P-03, P-04, P-16, P-17, P-19, P-23, P-25, P-29, P-31, P-32, P-34, and P-36). The AC pavement ranged from about 4 to 6 inches in thickness and was typically underlain by about 4 inches of crushed rock base. Portland Cement Concrete (PCC) pavement was encountered in two borings (B-1 and P-27). In B-1, the PCC pavement was about 18 inches thick and underlain by about 12 inches of crushed rock base. In P-27, the PCC pavement section was about 6 inches thick.

5.1.2 Fill

Undocumented fill materials were present in all the explorations and were likely placed for site grading and development. We observed highly variable fill depths across the site, extending from the existing ground surface to depths ranging from 2 to 16.5 feet bgs. Additionally, the fill depths often varied considerably over short distances. The fill was underlain by bedrock, and generally consisted of silt with variable amounts of organics, lean to fat clay with variable amounts of sand and gravel, sand and gravel with variable amounts of silt and clay, and organic soil with variable amounts of sand. Undocumented fill refers to materials placed without (available) records of subgrade conditions or evaluation of compaction. Standard Penetration Tests (SPTs) conducted within the fill yielded N-values ranged from 0 to 45 blows per foot (bpf). The higher N-values were generally recorded at the fill-bedrock contact.

5.1.3 Boulders

Based on drilling action and slow advancement rates, we believe that large cobbles or boulders were encountered between 7.5 to 9 feet bgs in boring P-36, located in the southeast corner of the WRF site.

5.1.4 Basalt - Little Butte Volcanic Series Tholeiitic Basalt

The Little River Butte Volcanic Series (LRBV) in the project area consists of tholeiitic basalt and is bedrock in this area. The basalt was encountered beneath the fill in all the explorations. The contact between fill and LBVS was generally selected based on auger refusal, drilling resistance, drill cuttings, and/or SPT refusal (more than 50 blow counts for 6 inches or less of penetration). The depth to the LRBV ranged from 2.0 feet to 16.5 feet bgs.

The strength of the basalt rock generally varies from strong to very strong (R4 to R5). Rock strength descriptors are presented in Table 5-1. The basalt is slightly weathered to fresh, moderately to highly fractured (i.e., joint spacing from 3 feet to 2 inches), and gray. The joints were generally sub-horizontal or high angle, smooth to rough, planar, curved, and irregular in shape. The occasional joint had a less than 0.1-inch-thick light blue green coating. Core recovery ranged from 80 to 100 percent. The Rock Quality Designation of the cored rock (RQD) ranged from 42 to 86 percent, with an average value of 67 percent.

Table 5-1. Definition of Rock Strength Descriptions

Grade[1]	Approximate Uniaxial Compressive Strength (psi)	Qualitative Description
R0	35 – 150	Extremely Weak
R1	150 – 700	Very Weak
R2	700 – 3,600	Weak
R3	3,600 – 7,200	Medium Strong
R4	7,200 – 14,500	Strong
R5	14,500 – 36,000	Very Strong
R6	>36,000	Extremely Strong

[1] Rock strength grades from Brown (1981).

Three unconfined compressive strength tests were completed on selected rock core samples. The unconfined compressive strength of the rock cores ranged from 6,932 psi to 25,919 psi with an average value of 19,384 psi. The results of point load tests indicate the Point Load Index ($I_{S(50)}$) of the basalt ranged between approximately 268 psi and 714 psi, with an average value of 508 psi. Depth to rock at each exploration is summarized in Table 5-2. The depth to bedrock is also included on the geologic cross sections shown in Figures 3A through 3F.

Table 5-2. Depth of Fill / Depth to Rock Summary

Exploration ID	Associated Structure(s)	Ground Surface Elevation (feet)	Depth to Rock (feet)	Rock Surface Elevation (feet)
B-1	--	516.5	2.5	514.0
B-2	SC90 WAS Pump Station	518.3	16.5	501.8
B-3	Primary Clarifier	529.9	11	518.9
B-4	Building A – O&M & Controls	538.6	4.5	534.1
B-5	MEB Building	528.8	8.5	520.3
P-01	--	517.3	11	506.3
P-02	--	526.1	11.5	514.6
P-03	Primary Clarifier	530.4	16	514.4
P-04	Building A – Headworks & Dewatering	530.8	7.5	523.3
P-05	Building A – Headworks & Dewatering	533.1	3.5	529.6
P-06	Building A – O&M & Controls	536.2	3.5	532.7
P-07	--	538.0	2.5	535.5
P-08	Building A – O&M & Controls	535.3	7.5	527.8
P-09	--	530.5	4	526.5
P-10	--	530.1	5.5	524.6
P-11	MEB Building	529.8	5.5	524.3
P-12	MEB Building	526.4	5	521.4
P-13	Future Aeration Basin No. 4	523.6	8.5	515.1
P-14	Aeration Basin No. 3	521.7	5.5	516.2
P-15	--	519.1	2.5	516.6
P-16	IPS	517.1	12.0	505.1
P-17	--	516.5	6.0	510.5
P-18	SC90, SC60 RAS/WAS Pump Station	518.5	9.0	509.5
P-19	--	518.0	6.0	512.0
P-20	SC90 RAS Pump Station	525.4	8.0	517.4
P-21	Primary Clarifier, Aeration Basin No. 3	521.8	6.0	515.8
P-22	Aeration Basin No. 3	518.5	7.0	511.5
P-23	Primary Clarifier	530.4	15.0	515.4
P-24	MEB Building	529.7	3.0	526.7
P-25	Future Outfall	506.4	2.0	504.4
P-26	Future Outfall	507.2	3.0	504.2
P-27	--	516.6	10.0	506.6
P-28	IPS	516.5	11.0	505.5
P-29	IPS	517.3	12.5	504.8
P-30	SC90	519.8	11.0	508.8
P-31	SC90	520.8	10.0	510.8
P-32	Primary Clarifier, Future Primary Clarifier No. 4	530.4	10.0	520.4
P-33	Future Outfall	529.6	3.5	526.1
P-34	Tertiary Filters	516.9	15.0	501.9
P-35	-	517.5	6.0	511.5
P-36	Sludge Blend Tank, Digested Sludge Holding Tank, Solids Building	516.8	10.8	506.0

5.2 Groundwater

Two-inch diameter, PVC groundwater observation wells were installed in borings B-3 and B-5. Initial groundwater levels recorded on May 2, 2018, with subsequent levels recorded on October 29, 2019, and on June 20, 2022. We also observed groundwater in nine other exploration locations, as summarized in Table 5-3. Groundwater levels are noted on the boring logs in Appendix A.

Groundwater levels may vary with precipitation, the time of year, and/or other factors. Generally, groundwater highs occur near the end of the wet season in late spring and groundwater lows occur near the end of the dry season in the early fall.

Table 5-3. Groundwater Level Measurements

Boring ID	Piezometer	Borehole Elevation (feet)	Depth to Groundwater (feet)			Groundwater Elevation (feet)		
			May 2, 2018	Oct 29, 2019	June 20, 2022	May 2, 2018	Oct 29, 2019	June 20, 2022
B-2	No	518.3	2.5	-	-	515.8	-	-
B-3	Yes	529.9	2.9	3.6	8.2	527.0	526.3	521.7
B-4	No	538.6	2.0	-	-	536.6	-	-
B-5	Yes	528.8	5.0	7.0	6.8	523.8	521.8	522.0
P-03	No	530.4	8.5	-	-	521.9	-	-
P-09	No	530.5	3.0	-	-	527.5	-	-
P-13	No	523.6	6.0	-	-	517.6	-	-
P-15	No	519.1	2.5	-	-	516.6	-	-
P-29	No	517.3	-	-	10.5	-	-	506.8
P-31	No	520.8	-	-	9.2	-	-	511.6
P-32	No	530.4	-	-	9.7	-	-	520.7

6.0 Limitations

This Geotechnical Data Report has been prepared for the City of Sweet Home Mahler Water Reclamation Facility Improvements Project located in Sweet Home, Oregon. This report contains a compilation of information from field explorations, laboratory test data, and published literature. The professional judgments and characterizations presented herein are based on this information. McMillen Jacobs Associates is not responsible for errors and omissions that may appear in the field exploration and laboratory test results performed by others.

It shall be noted that the geotechnical data were obtained at specific exploration locations at specific times. It must be acknowledged that variations in soil/rock conditions exist between exploration locations, and this report does not necessarily reflect the variations between explorations. The nature and extent of variation may not become evident until exposed during construction. No analyses, interpretations between exploration locations, conclusions, or design recommendations are contained in this report. This report should be made available to prospective contractors for use as factual data only, and not as a warranty of subsurface conditions.

The scope of our geotechnical services has not included an environmental evaluation regarding the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below the site, or for evaluation of disposal of contaminated soils or groundwater, should they be encountered.

This report has been completed within the limitations of the agreement between the Owners and West Yost Associates, Inc. and the West Yost Associates, Inc.-approved scope of work, schedule, and budget with McMillen Jacobs Associates. The services rendered have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same area. McMillen Jacobs Associates is not responsible for the use of this report in connection with anything other than the project at the project location.

MCMILLEN JACOBS ASSOCIATES



Wolfe Lang, P.E., G.E.
Principal Geotechnical Engineer

Jeff Quinn, P.E.
Senior Project Engineer

7.0 References

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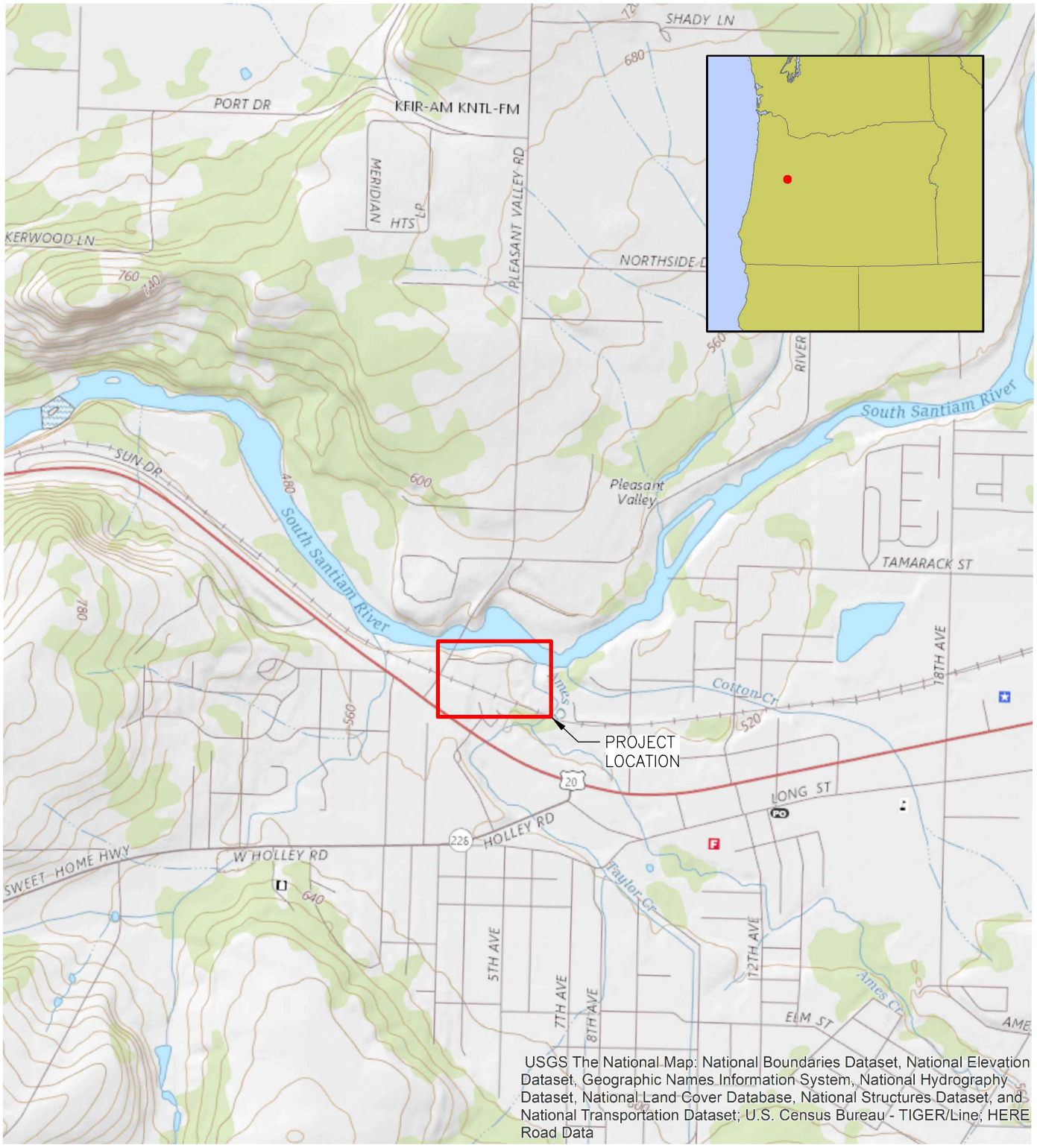
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Figures



PROJECT VICINITY MAP

SCALE: NTS

N

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CITY OF SWEET HOME

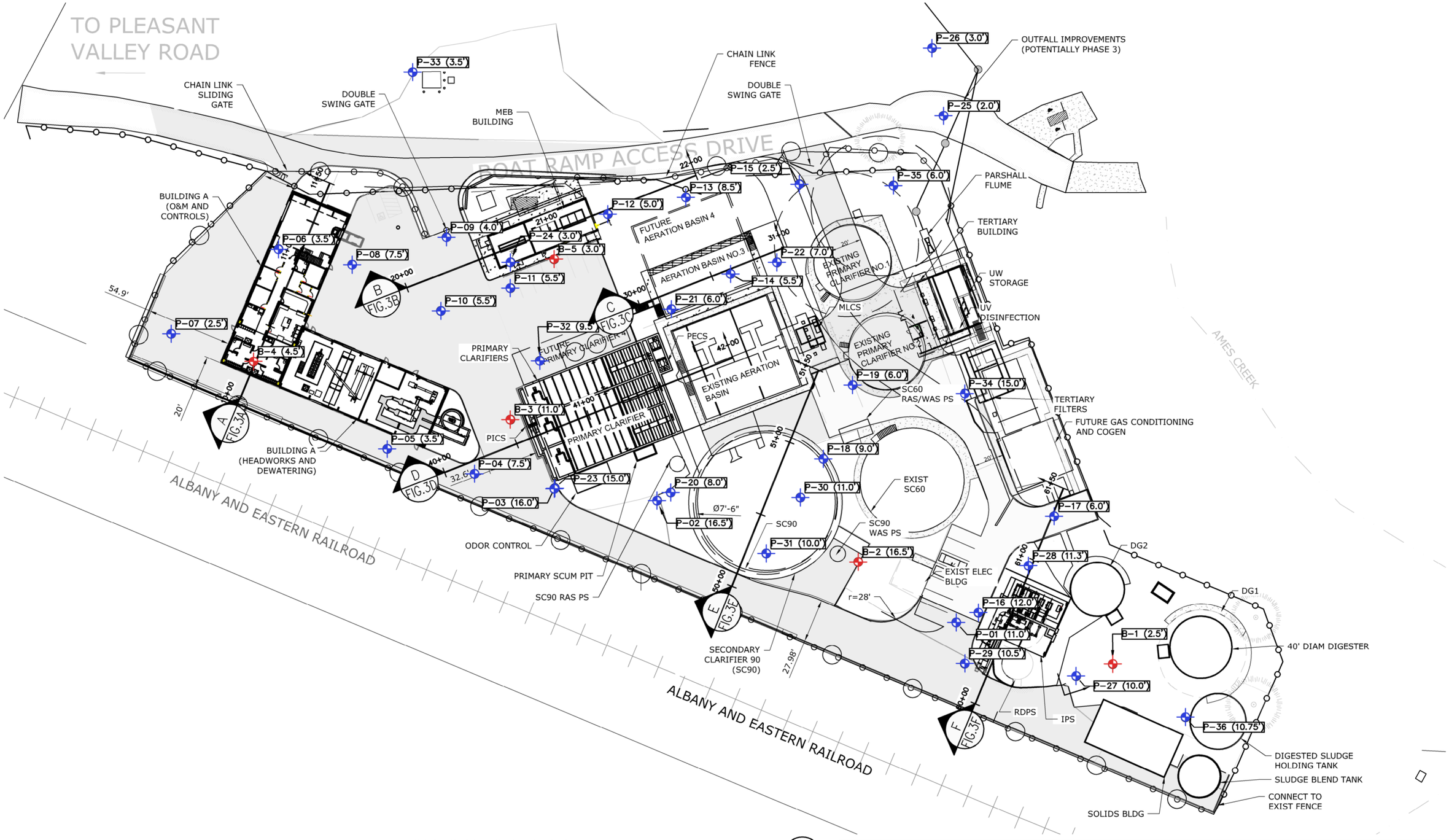
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
PROJECT VICINITY MAP

FIG.1

DEC 2022

Path: C:\Users\cburke\Box\Jobs\636 7.0 Sweet Home WWTP Final Design Review\900 Design Technology\970_Xrefs\Fig.1 – Vicinity map.dwg Plot date: Jul 21, 2022, CAD User: cburke



LEGEND:

B–1 (XX.X') BOREHOLE LOCATION (DEPTH TO ROCK IN FT)

P–01 (XX.X') PROBE–HOLE LOCATION (DEPTH TO ROCK IN FT)

EXPLORATION PLAN

SCALE: 1"=60'

0' 60' 120'

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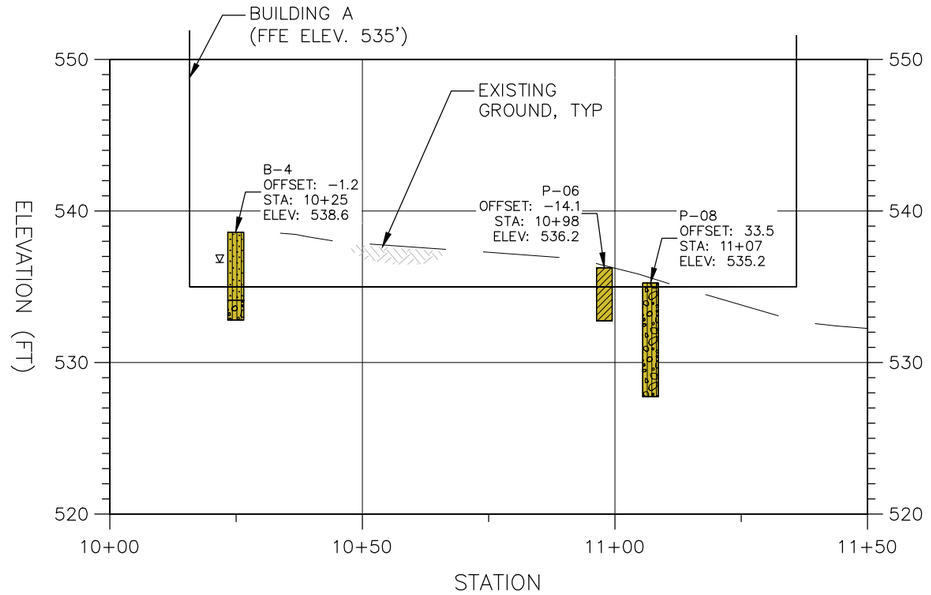
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
EXPLORATION PLAN

FIG.2

DEC 2022

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GEOLOGIC PROFILE STA 10+00 TO 11+50

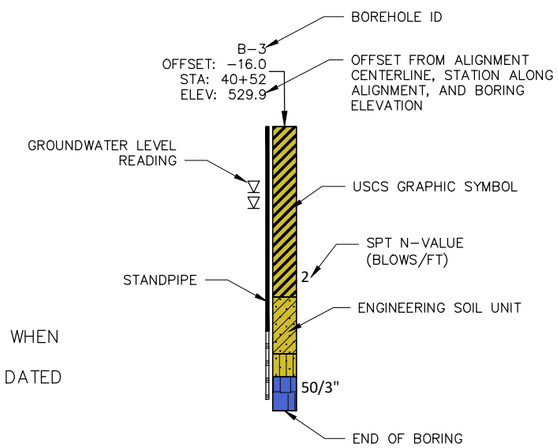
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1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

1. BOREHOLE LOCATIONS ARE APPROXIMATE.
2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

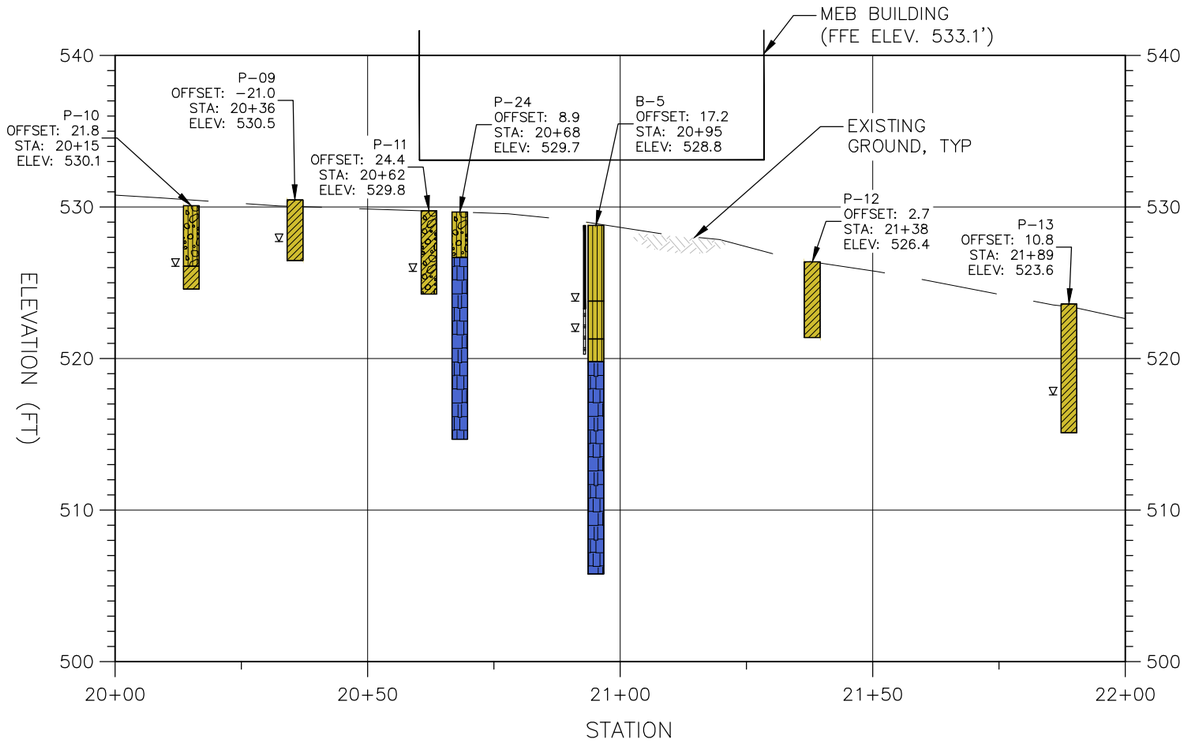
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
BUILDING A

FIG.3A

DEC 2022

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GEOLOGIC PROFILE STA 20+00 TO 22+00

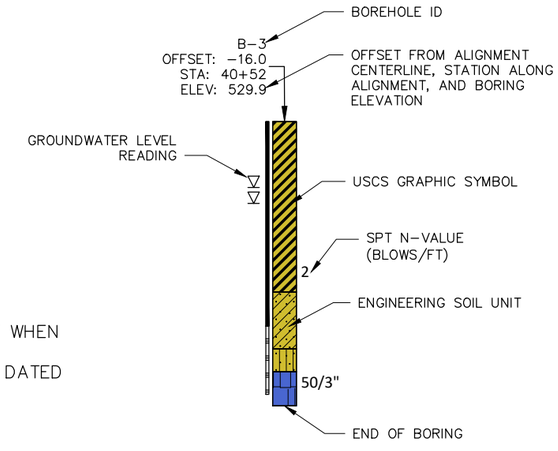
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
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McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

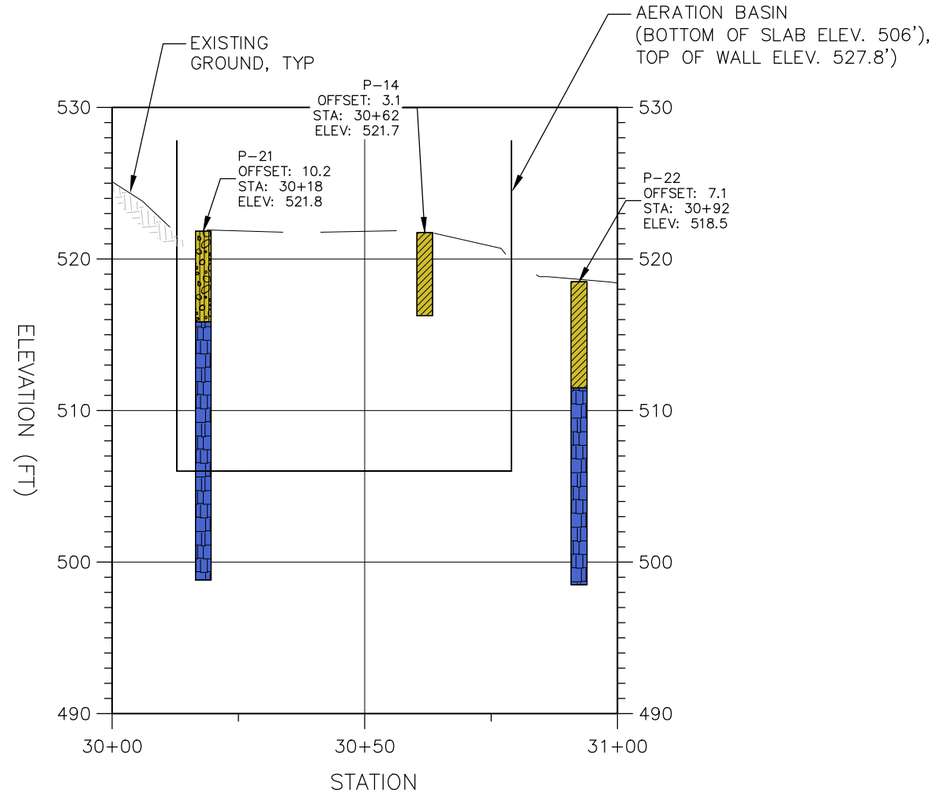
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
MEB BUILDING

FIG.3B

DEC 2022

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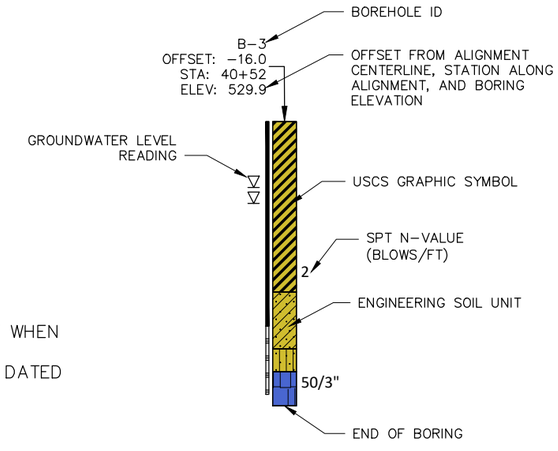
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

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CITY OF SWEET HOME

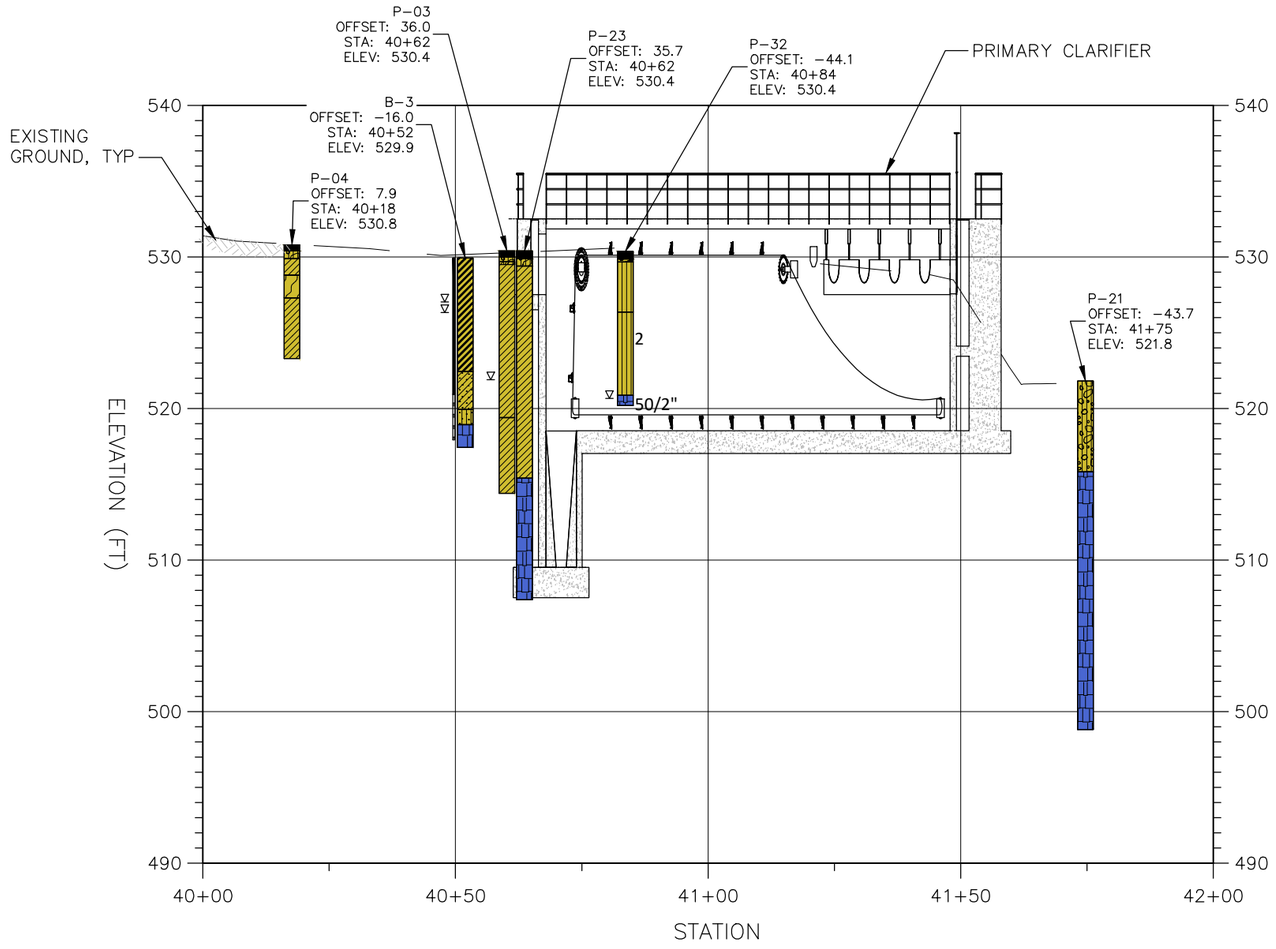
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
AERATION BASIN NO. 3

FIG.3C

DEC 2022

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GEOLOGIC PROFILE STA 40+00 TO 42+00

SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

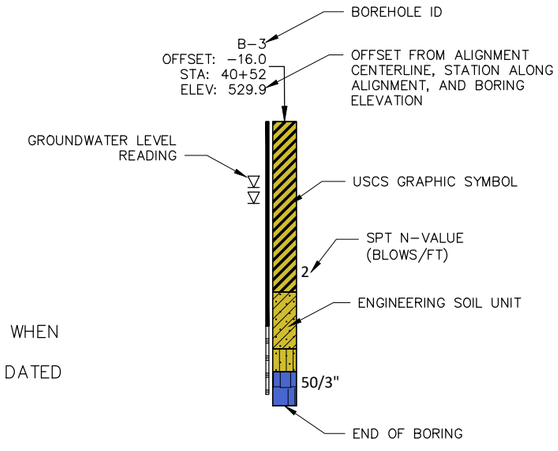
STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

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BORING/PROBE-HOLE LEGEND:



McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

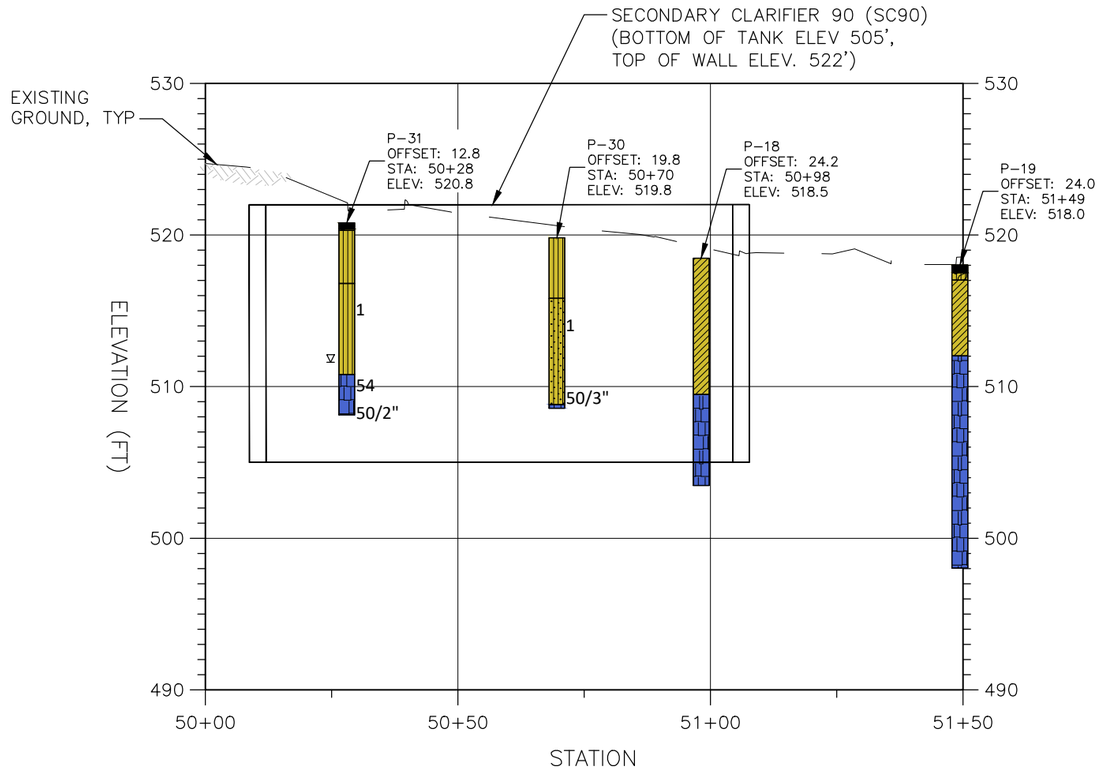
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
PRIMARY CLARIFIER

FIG.3D

DEC 2022

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GEOLOGIC PROFILE STA 50+00 TO 51+50

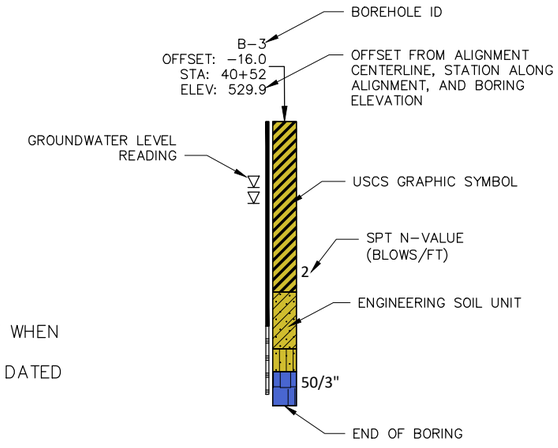
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
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McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

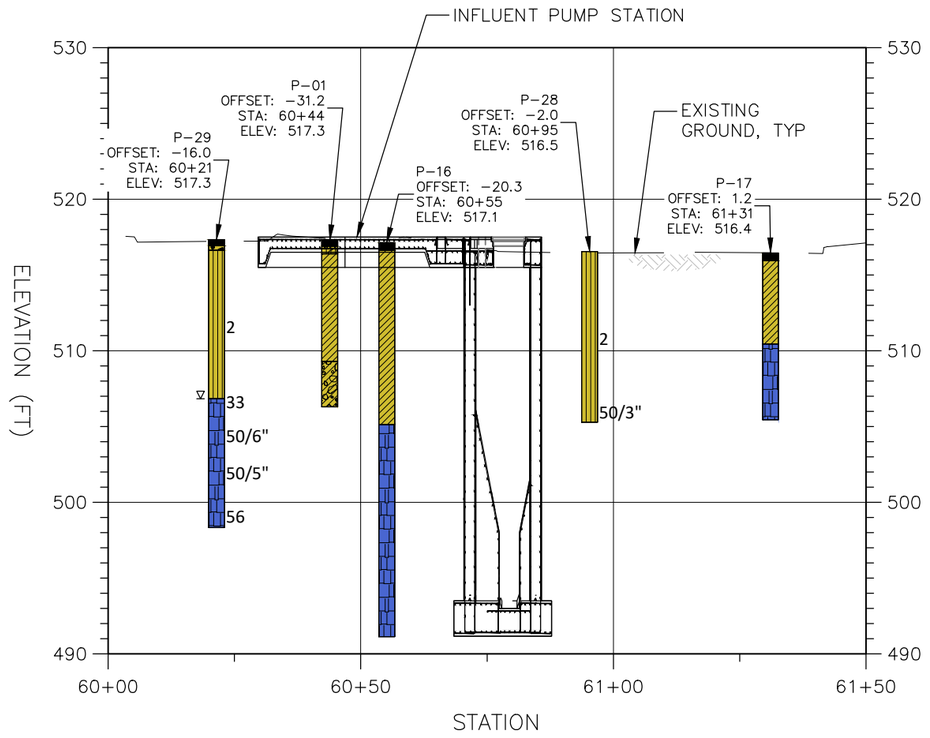
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
SECONDARY CLARIFIER 90 (SC90)

FIG.3E

DEC 2022

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GEOLOGIC PROFILE STA 60+00 TO 61+50

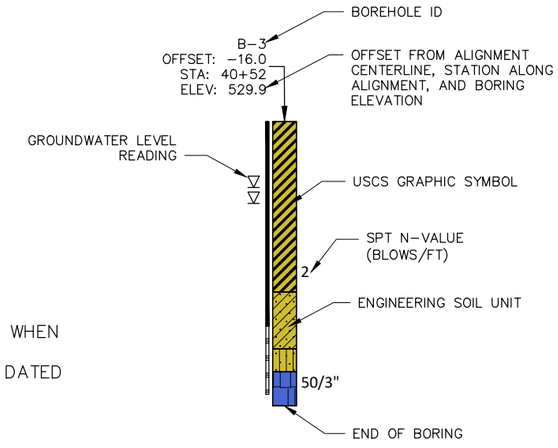
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
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- FAT CLAY (CH)
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McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL DATA REPORT
GEOLOGIC PROFILE
INFLUENT PUMP STATION

FIG.3F

DEC 2022

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Appendix A

Boring Logs

McMILLEN JACOBS ASSOCIATES

Key to Log of Borings and Descriptive Terms for Soils
Project: 5834.0 Sweet Home WWTP Schematic Design
Sweet Home, OR

Soil Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS Based on ASTM D2488 & D2487)					
MAJOR DIVISIONS			GROUP/SYMBOL		TYPICAL DESCRIPTION
COARSE-GRAINED SOILS (50% or more retained on No. 200 sieve)	GRAVELS (more than 50% retained on No. 4 sieve)	CLEAN GRAVELS (less than 5% fines)	GW		WELL-GRADED GRAVEL
			GP		POORLY GRADED GRAVEL
		GRAVELS (with 5 to 12% fines)	GW-GM		WELL-GRADED GRAVEL WITH SILT
			GW-GC		WELL-GRADED GRAVEL WITH CLAY
			GP-GM		POORLY GRADED GRAVEL WITH SILT
			GP-GC		POORLY GRADED GRAVEL WITH CLAY
		GRAVELS WITH FINES (more than 12% fines)	GM		SILTY GRAVEL
			GC		CLAYEY GRAVEL
	SANDS (less than 50% retained on No. 4 sieve)	CLEAN SANDS (less than 5% fines)	SW		WELL-GRADED SAND
			SP		POORLY GRADED SAND
		SANDS (with 5 to 12% fines)	SW-SM		WELL-GRADED SAND WITH SILT
			SW-SC		WELL-GRADED SAND WITH CLAY
			SP-SM		POORLY GRADED SAND WITH SILT
			SP-SC		POORLY GRADED SAND WITH CLAY
		SANDS WITH FINES (more than 12% fines)	SM		SILTY SAND
			SC		CLAYEY SAND
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS & CLAYS (liquid limit less than 50)	INORGANIC	ML		SILT
			CL		LEAN CLAY
		ORGANIC	OL		LOW PLASTICITY ORGANIC CLAY
	SILTS & CLAYS (liquid limit greater than 50)	INORGANIC	MH		ELASTIC SILT
			CH		FAT CLAY
		ORGANIC	OH		HIGH PLASTICITY ORGANIC CLAY
	SILT/CLAY (liquid limit between 12 and 25)	INORGANIC	CL-ML		CLAYEY SILT / SILTY CLAY
HIGHLY ORGANIC SOILS	PRIMARILY ORGANIC MATTER		PT		PEAT

Notes:

1. Dual symbols (symbols separated by a hyphen, e.g. SP-SM, slightly silty fine SAND) are used for soils between 5% and 12% fines or when liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

Moisture Content

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water, usually from below water table.

Gradation

Gradation	Description
Well-Graded	Approximately equal amounts of all grain sizes
Poorly Graded	Predominately one size (uniformly graded) or a wide range of sizes with a missing intermediate size (gap-graded)

Grain Size

Term	Grain Size	Example
Boulder	Greater than 12" (30cm)	Basketball or Larger
Cobble	3" - 12" (75mm - 30cm)	Fist to Basketball
Gravel Coarse	¾" - 3" (20mm - 75mm)	Thumb to Fist Sized
Gravel Fine	No. 4 Sieve - ¾" (5mm - 20mm)	Pea to Thumb Sized
Sand Coarse	No. 10 Sieve - No. 4 Sieve (2mm - 5mm)	Rock Salt to Pea Sized
Sand Medium	No. 40 Sieve - No. 10 Sieve (0.4mm - 2mm)	Sugar to Rock Salt
Sand Fine	No. 200 sieve - No. 40 sieve (0.08mm - 0.4mm)	Flour to Sugar
Fines	Passing No. 200 Sieve (0.08mm)	Grains Not Visible

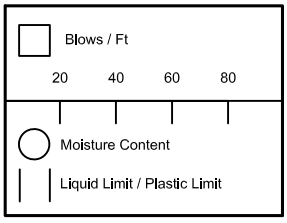
Relative Consistency

Fine - Grained Soils	
Relative Density	N, SPT Blows/Foot
Very Soft	< 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	> 30

Criteria for Describing Plasticity

Description	Criteria
Nonplastic	A ⅛" (3mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

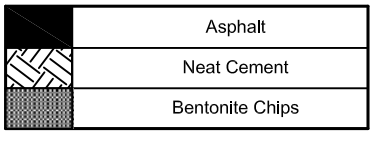
Test Symbols



Relative Density

Coarse - Grained Soils	
Relative Density	N, SPT Blows/Foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

Backfill Symbols



High/Low Water Level Screened Well Interval



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Key to Boring Logs - Rock

Rock Strength

Description	Recognition	Uniaxial Compressive Strength (psf)
Extremely Weak Rock	Indented by thumbnail	30 to 150
Very Weak Rock	Peeled by pocket knife	150 to 700
Weak Rock	Peeled with difficulty by pocket knife	700 to 3,600
Moderately Strong Rock	Indented 5 mm with sharp end of pick	3,600 to 7,200
Strong Rock	One hammer blow to fracture	7,200 to 14,500
Very Strong Rock	Many hammer blows to fracture	14,500 to 36,000
Extremely Strong Rock	Only chipped by hammer blows	> 36,000

Core Recovery Calculation (%)

$$\frac{\Sigma \text{ Length of recovered core}}{\text{Total Length of core run}} \times 100$$

RQD Calculation (%)

$$\frac{\Sigma \text{ Length of core pieces} > 4 \text{ in.}}{\text{Total Length of core run}} \times 100$$

Rock Weathering

Residual Soil	Entirely decomposed to secondary minerals; material can be easily broken by hand
Completely Weathered	Almost entirely decomposed to secondary minerals; material can be granulated by hand
Highly Weathered	More than half of the rock is decomposed
Moderately Weathered	Rock is discolored and noticeably weakened, but less than half is decomposed
Slightly Weathered	Rock is slightly discolored, but not noticeably lower in strength than fresh rock
Fresh	Rock shows no discoloration, loss of strength, or other effect of weathering or alteration

Discontinuity Type

J	Joint
FJ	Joint along foliation
S	Shear
F	Fault
HJ	Healed joint
MB	Mechanical break
B	Joint along bedding

Rock Fracture Spacing

Extremely Close Spacing	Fractures spaced less than 1 inch apart
Very Close Spacing	Fractures spaced 1 to 2.5 inches apart
Close Spacing	Fractures spaced 2.5 to 8 inches apart
Moderate Spacing	Fractures spaced 8 inches to 2 feet apart
Wide Spacing	Fractures spaced 2 to 6.5 feet apart
Very Wide Spacing	Fractures spaced 6.5 to 20 feet apart
Extremely Wide Spacing	Fractures spaced greater than 20 feet apart

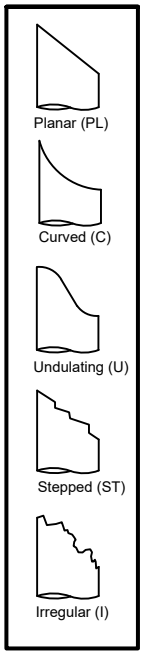
Sample Symbols

	HQ3 Rock Coring

Lithology Graphics

Basalt  Core Loss/ No Recovery 

Fracture Shape



Surface Roughness

Slickensided	Surface has smooth, glassy finish with visual evidence of striations
Smooth	Surface appears smooth and feels so to the touch
Slightly Rough	Asperities on discontinuity surfaces are distinguishable and can be felt
Rough	Ridges and side-angle steps are evident, surface feels very abrasive
Very Rough	Near vertical steps and ridges occur on discontinuity surface

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-1

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary and HQ Wireline/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **13.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **516.5 ft**	
Location: **Survey**	Coordinates: **7617396.39 E, 275319.73 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete - 18" thick (Pavement)		
							GM	Dense, moist, gray Silty Gravel (GM); Fine to coarse angular gravel, low plasticity silt (Base Aggregate)		At 2.5 feet very slow, very rough drilling. At 3.5 feet switch to rock coring.
512 / 5		100	RUN 1					BASALT, very strong (R5), slightly weathered to fresh, moderately to highly fractured, planar, stepped, smooth to rough joints with very narrow apertures (Little Butte Volcanic Series - Tholeiitic Basalt) *Run 1: 3.5-8.5 feet.* *RQD = 59%*		From 5.20 feet to 6.30 feet, UCS = 25,300 psi.
507 / 10		80	RUN 2					*Run 2: 8.5 -13.5 feet:* *RQD = 42%* *Planar and irregular, smooth to slightly rough joints.*		
502 / 15										Borehole completed at 13.5ft. below ground surface (bgs).
497 / 20										
492 / 25										
487 / 30										

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Boring B-1

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-2

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **16.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **518.2 ft**	
Location: **Survey**	Coordinates: **7617232.28 E, 275385.44 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514							OL/ OH	Organic Soil (OL/OH); Mulch (Fill)		
5/2/2018 1▼		47	S1	7-5-11 (N=16)			CL	Very stiff, moist, brown to gray brown, Sandy LEAN CLAY with Gravel (CL); Medium plasticity, medium to low toughness, fine to coarse sand, fine angular gravel (Fill)		
5		27	S2	2-4-4 (N=8)			SM	Loose, moist to wet, brown, Silty SAND with Gravel (SM); Fine to coarse sand, fine angular gravel, medium plasticity, slow dilatancy (Fill)		
		53	S3	2-3-1 (N=4)				Very loose, wet, brown, Silty SAND (SM); Fine to medium sand, low plasticity fines, rapid dilatancy (Fill)		
509										
10		73	S4	2-0-0 (N=WOR)			SM	*At 10.0 grades to orange-brown, occurrence of trace, fine, angular gravel, and slow dilatancy.*		
		33	S5	0-0-1 (N=1)						
504										
15		100	S5	17-18-27 (N=45)			GC	Very dense, moist, gray and olive-brown, CLAYEY GRAVEL with Sand (GC); Fine to coarse angular gravel, fine to coarse sand, medium plasticity fines (Fill)		Borehole completed at 16.5ft. below ground surface (bgs).
499										
20										
494										
25										
489										
30										

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Boring B-2

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-3

Date(s) Drilled: **05/02/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **12.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **529.9 ft**	
Location: **Survey**	Coordinates: **7617007.93 E, 275477.18 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 5		53	S1	3-2-1 (N=3)			CH	Soft, moist, gray with trace orange mottles, Sandy FAT CLAY (CH); High plasticity, medium toughness, fine sand, occasional organics (Fill)		
		60	S2	0-1-1 (N=2)				*At 5.0 feet grades to scattered woody organics.*		
		100	S3	1-1-1 (N=2)			SC	Very loose, moist to wet, gray, CLAYEY SAND (SC); Fine to medium sand, medium plasticity and medium toughness fines, occasional 1-inch sandy lenses of slow dilatancy (Fill)		
520 / 10		87	S4	0-16-49 (N=65)			SM	Medium dense, wet, red-brown, SILTY SAND (SM); Fine to medium sand, low plasticity fines, slow dilatancy (Fill)		
		0	S5	50/0" (Refusal)				Dark gray basalt chips in cuttings (Little Butte Volcanic Series - Tholeiitic Basalt)		At 11.0 feet very rough , very slow drilling.
515 / 15										Borehole completed at 12.5ft. below ground surface (bgs).
510 / 20										
505 / 25										
500 / 30										

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Boring B-3

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-4

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.8 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **538.6 ft**	
Location: **Survey**	Coordinates: **7616842.35 E, 275514.57 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
534 5/2/2018 1		20	S1	7-10-7 (N=17)			SM	Medium dense, moist to wet, dark gray, SILTY SAND with Gravel (SM); Fine to medium sand, fine angular gravel, low plasticity fines, slow dilatancy, scattered organics (Fill)		
5		120	S2	28-50/3" (Refusal)			GM	Very dense, moist, gray and orange, SILTY GRAVEL with Sand (GM); Fine to coarse gravel, fine to coarse sand, medium plasticity fines (Fill)		At 4.5 feet very slow, very rough drilling.
529 10										Borehole completed at 5.8ft. below ground surface (bgs).
524 15										
519 20										
514 25										
509 30										

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Boring B-4

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-5

Date(s) Drilled: **05/02/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary and HQ Wireline/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **528.8 ft**	
Location: **Survey**	Coordinates: **7617036.16 E, 275580.52 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
524 / 5		53	S1	1-5-6 (N=11)			ML	Stiff, moist, gray, Sandy SILT (ML); Low plasticity, medium toughness, fine sand, trace coarse sand, occasional organics (Fill)		
		53	S2	1-1-1 (N=2)			ML	Soft, moist to wet, green to red-brown, Sandy SILT (ML); Low plasticity, low toughness, fine to medium sand, occasional organics (Fill)		
10/29/2015 11:2016 1		73	S3	1-4-11 (N=15)			ML	Stiff, wet, gray and red-brown, Sandy SILT (ML); Low plasticity, medium toughness fines, fine sand, trace medium and coarse sand, occasional organics (Fill)		At 8.5 feet, more difficulty drilling, driller remarks likely weathered rock.
519 / 10		100	RUN 1					Run 1: 9.0 - 13.0 feet, RQD = 75%; BASALT, very strong (R5), slightly weathered to fresh, moderately to highly fractured, planar and curved, smooth to rough, high angle and sub-horizontal narrow joints (Little Butte Volcanic Series - Tholeiitic Basalt)		At 9.0 feet, switch to rock coring. RQD = 75%. From 11.7 feet to 12.4 feet UCS = 29,919 psi.
								Run 2: 13.0-18.0 feet, RQD = 86%, addition of irregular joints and < 0.1" thick light blue green staining/coating of occasional joints.		At 13.0 feet RQD = 86%.
514 / 15		100	RUN 2							
								Run 3: 18.0-23.0 feet, RQD = 74%, grade to medium strong based on testing		At 18.0 feet RQD = 74%. From 18.0 feet to 19.0 feet UCS = 6,932 psi.
509 / 20		100	RUN 3							
504 / 25										Borehole completed at 23ft. below ground surface (bgs).
499 / 30										

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Boring B-5

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-01

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **517.3 ft**	
Location: **Survey**	Coordinates: **7617295.47 E, 275346.48 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Dense, gray, Silty GRAVEL (GM); (Base Aggregate)		
513 / 5			S1				CL	Very soft to soft, moist, brown, LEAN CLAY with Sand (CL); Low plasticity, medium toughness, fine sand, trace medium sand, occasional organics (Fill)		At 9.0 feet driller remarks that the material stiffens.
508 / 10							GC	Very loose to loose, moist to wet, gray brown, CLAYEY GRAVEL with Sand (GC); Fine to coarse angular basalt gravel, fine to coarse sand, low plasticity fines (Fill)		At 10.0 feet, driller remarks that the material feels like rock but the auger is able to continue to spin. Auger refusal at 11 feet.
503 / 15										Borehole completed at 11ft. below ground surface (bgs).
498 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
493 / 25										
488 / 30										

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Boring P-01

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-02

Date(s) Drilled: **05/01/2018 - 01/05/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **526.1 ft**	
Location: **Survey**	Coordinates: **7617102.54 E, 275424.97 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
522 / 5							CL	Soft to very soft, moist, brown to light brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine angular gravel, occasional organics (Fill)		At 2.5 feet very slow, very rough drilling.
517 / 10										Auger refusal at 11.5 feet.
512 / 15										Borehole completed at 11.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
507 / 20										
502 / 25										
497 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-02

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-03

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **16.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.4 ft**	
Location: **Survey**	Coordinates: **7617036.27 E, 275432.54 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 / 0							GM	Asphalt (Pavement) Base rock (Fill) Very soft to soft, moist, dark gray-brown, LEAN CLAY with Sand (CL); Fine sand (Fill)		
5							CL			
4/30/2018 ▼										
521 / 10							CL	Very soft to soft, moist to wet, gray, Sandy LEAN CLAY (CL); Medium plasticity, fine to medium sand (Fill) *At 13.0 feet, grades to brown, moist to wet, decrease in sand content.*		
516 / 15										Auger refusal at 16 feet.
										Borehole completed at 16ft. below ground surface (bgs).
511 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
506 / 25										
501 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-03

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-04

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **7.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.8 ft**	
Location: **Survey**	Coordinates: **7616984.89 E, 275442.28 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
							GM	Dense, moist, gray Silty GRAVEL (GM); Fine to coarse angular gravel, low plasticity silt, 5 inches thick (Base Aggregate)		
							CL			
			S1				OL/ OH	Very soft to soft, moist, dark gray-brown, LEAN CLAY (CL); (Fill)		At 2.5 feet driller remarks that material becomes stiffer, woody material began smoking so driller added water to hole, very slow drilling. Organic chemical odor in the wood fiber of Sample 1.
526								Hard, moist, brown, Organic Soil with Sand (OL/OH); Frequent hard wood in clay (Fill)		
5								Very soft to soft, moist, green-brown with brown-orange mottles, LEAN CLAY (CL); Low plasticity, fine sand, trace medium sand (Fill)		
			S2				CL			Auger refusal at 7.5 feet.
521										Borehole completed at 7.5ft. below ground surface (bgs).
10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
516										
15										
511										
20										
506										
25										
501										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-04

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-05

Date(s) Drilled: **05/01/2018 - 05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **3.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **533.1 ft**	
Location: **Survey**	Coordinates: **7616928.58 E, 275458.29 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							CL	Very soft to soft, moist, brown to light brown, LEAN CLAY with Sand (CL); Low plasticity, medium toughness, fine sand, trace coarse angular gravel, occasional organics (Fill)		Auger refusal at 3.5 feet.
529 / 5										Borehole completed at 3.5ft. below ground surface (bgs).
524 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
519 / 15										
514 / 20										
509 / 25										
504 / 30										

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Boring P-05

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-06

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **3.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **536.2 ft**	
Location: **Survey**	Coordinates: **7616858.52 E, 275586.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
			S1				CL	Stiff, moist to wet, brown, LEAN CLAY (CL); Low plasticity, medium toughness, trace fine to medium sand, fine gravel, occasional woody organics (Fill)		Auger refusal at 3.5 feet.
532 / 5										Borehole completed at 3.5ft. below ground surface (bgs).
527 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
522 / 15										
517 / 20										
512 / 25										
507 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-06

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-07

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **2.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **538.0 ft**	
Location: **Survey**	Coordinates: **7616789.32 E, 275532.46 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Very loose to loose, moist, dark brown, SILTY GRAVEL with Sand (GM); Angular fine to coarse gravel with cobbles, low plasticity fines (Fill)		Auger refusal at 2.5 feet.
533 5										Borehole completed at 2.5ft. below ground surface (bgs).
528 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
523 15										
518 20										
513 25										
508 30										

McMILLEN JACOBS ASSOCIATES

Boring P-07

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-08

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **7.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **535.2 ft**	
Location: **Survey**	Coordinates: **7616905.96 E, 275577.01 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
531 / 5			S1				GM	Very loose to loose, moist, dark brown, SILTY GRAVEL with Sand (GM); Fine to coarse angular to subangular gravel, fine to coarse sand, low plasticity fines, occasional woody organics (Fill)		Slight petroleum odor while drilling. Auger refusal at 7.5 feet.
526 / 10										Borehole completed at 7.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
521 / 15										
516 / 20										
511 / 25										
506 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-08

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-09

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **4.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.5 ft**	
Location: **Survey**	Coordinates: **7616966.80 E, 275594.59 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 5/2/2018 ▼ 5			S1				CL	Moist, gray-brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel, scattered organics (Fill)		Slight petroleum odor. Auger refusal at 4 feet.
										Borehole completed at 4ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
521 10										
516 15										
511 20										
506 25										
501 30										

McMILLEN JACOBS ASSOCIATES

Boring P-09

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-10

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.1 ft**	
Location: **Survey**	Coordinates: **7616963.18 E, 275547.22 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 0							GM	Very loose to loose, moist, brown, SILTY GRAVEL with Sand (GM); Fine to coarse gravel, fine and coarse sand, low plasticity. (Fill)		
5/1/2018 1							CL	Very soft to soft, wet, gray-brown, LEAN CLAY with Sand (CL); Low plasticity, fine sand, trace angular fine angular gravel. (Fill)		Auger refusal at 5.5 feet.
521 5										Borehole completed at 5.5ft. below ground surface (bgs).
516 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
511 15										
506 20										
501 25										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-10

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-11

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **529.8 ft**	
Location: **Survey**	Coordinates: **7617007.94 E, 275561.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 5			S1				GC	Very loose to loose, moist to wet, brown to gray brown, Clayey GRAVEL with Sand (GC); Fine to coarse gravel, fine to coarse sand (Fill)		Auger refusal at 5.5 feet.
520 10										Borehole completed at 5.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
515 15										
510 20										
505 25										
500 30										

5/1/2018 1

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Boring P-11

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-12

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **526.4 ft**	
Location: **Survey**	Coordinates: **7617070.84 E, 275609.56 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
522 / 5			S1				CL	Very soft to soft, moist, brown, Gravelly LEAN CLAY with Sand (CL); Low plasticity, fine to coarse angular gravel, fine to coarse sand (Fill)		Auger refusal at 5 feet.
517 / 10										Borehole completed at 5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
512 / 15										
507 / 20										
502 / 25										
497 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-12

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-13

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **8.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **523.6 ft**	
Location: **Survey**	Coordinates: **7617121.16 E, 275620.34 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
519 / 0							CL	Very soft to soft, moist to wet, dark brown to gray brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel (Fill)		Loose gravelly material begins caving at the ground surface.
5/6/2018 1										Auger refusal at 8.5 feet.
514 / 5										Borehole completed at 8.5ft. below ground surface (bgs).
509 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
504 / 15										
499 / 20										
494 / 25										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-13

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-14

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **521.7 ft**	
Location: **Survey**	Coordinates: **7617149.97 E, 275571.01 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
517 / 5			S1				CL	Very soft to soft, wet, gray-brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel (Fill)		Observed groundwater at approximately 4.0 feet water present, difficult to measure due to gravel.
512 / 10										Auger refusal at 5.5 feet.
507 / 15										Borehole completed at 5.5ft. below ground surface (bgs).
502 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
497 / 25										
492 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-14

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-15

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **2.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **519.1 ft**	
Location: **Survey**	Coordinates: **7617194.34 E, 275628.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
519 0							GC	Very loose to loose, moist to wet, brown, CLAYEY GRAVEL with Sand (GC); Fine angular gravel, fine to coarse sand (Fill)		Auger refusal at 2.5 feet.
4/30/2018 ▽										Borehole completed at 2.5ft. below ground surface (bgs).
515 5										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
510 10										
505 15										
500 20										
495 25										
490 30										

McMILLEN JACOBS ASSOCIATES

Boring P-15

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-16

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **26.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **517.1 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617309.79 E, 275352.81 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
513 / 5								Asphalt (Pavement) Soft, moist, brown, CLAY (CL) (Fill)		
							CL			
508 / 10										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
503 / 15										
498 / 20										
493 / 25										
										Borehole completed at 26ft. below ground surface (bgs).
488 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-16

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-17

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **11.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **516.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617358.56 E, 275414.92 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
								Soft, moist, brown, CLAY (CL) (Fill)		
							CL			
512 5										
								Basalt, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
507 10										
										Borehole completed at 11ft. below ground surface (bgs).
502 15										
497 20										
492 25										
487 30										

McMILLEN JACOBS ASSOCIATES

Boring P-17

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-18

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.5 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617209.77 E, 275451.86 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514 / 5							CL	Soft, moist, brown, CLAY (CL) (Fill)		
509 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
504 / 15										Borehole completed at 15ft. below ground surface (bgs).
499 / 20										
494 / 25										
489 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-18

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-19

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.0 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617228.61 E, 275499.48 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
								Soft, moist, brown, CLAY (CL) (Fill)		
514							CL			
5										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
509										
10										
504										
15										
499										
20										Borehole completed at 20ft. below ground surface (bgs).
494										
25										
489										
30										

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-20

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **525.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617111.38 E, 275430.15 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
521 / 5							CL	Soft, moist, brown, CLAY (CL) (Fill)		
516 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
511 / 15										
506 / 20										Borehole completed at 20ft. below ground surface (bgs).
501 / 25										
496 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-20

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-21

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **521.8 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617111.78 E, 275548.31 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
517 / 5							GM	Loose, gray, silty GRAVEL (GM) (Fill)		
512 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
507 / 15										
502 / 20										
497 / 25										Borehole completed at 23ft. below ground surface (bgs).
492 / 30										

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Boring P-21

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-22

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.5 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617179.82 E, 275578.51 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514 / 5							CL	Soft, moist, brown, slightly sandy CLAY (CL) (Fill)		
509 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
504 / 15										
499 / 20										Borehole completed at 20ft. below ground surface (bgs).
494 / 25										
489 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-22

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-23

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **530.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617036.68 E, 275432.95 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, slightly silty GRAVEL (GM) (Fill)		
								Soft, moist, brown, CLAY (CL) (Fill)		
526 / 5							CL			
521 / 10										
516 / 15								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
511 / 20										There was no return of rock chips until 22 feet bgs. Driller commented that the hole was being plugged by dirt and preventing return of rock fragments.
506 / 25										Borehole completed at 23ft. below ground surface (bgs).
501 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-23

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-24

Date(s) Drilled: **10/30/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **529.7 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617008.03 E, 275578.53 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 0							GM	Loose, gray, silty GRAVEL (GM) (Fill)		
525 / 5								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		Driller commented that it got wet around 5 feet bgs.
520 / 10										
515 / 15										Borehole completed at 15ft. below ground surface (bgs).
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-24

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-25

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **506.4 ft**	
Location: **Pleasant Valley Boat Ramp**	Coordinates: **7617287.27 E, 275672.91 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
502								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
5										
497										
10										
492										
15										Borehole completed at 15ft. below ground surface (bgs).
487										
20										
482										
25										
477										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-25

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-26

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **507.2 ft**	
Location: **Pleasant Valley Boat Ramp**	Coordinates: **7617279.85 E, 275716.52 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
503 5								BASALT, fractured, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		Driller comments that between 5 and 12 feet bgs seemed like highly fractured rock.
498 10										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
493 15										
488 20										
483 25										Borehole completed at 23ft. below ground surface (bgs).
478 30										

McMILLEN JACOBS ASSOCIATES

Boring P-26

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-27

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **26.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **516.6 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617372.72 E, 275312.04 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete (Pavement)		
								Soft, moist, brown, slightly sandy CLAY (CL) (Fill)		
512 / 5							CL			
507 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
502 / 15										
497 / 20										
492 / 25										
487 / 30										Borehole completed at 26ft. below ground surface (bgs).

McMILLEN JACOBS ASSOCIATES

Boring P-27

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-28

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 11.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 516.5 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617342.00 E, 275383.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
512 / 5		67	SPT-1	1-1-1 (N=2)			ML	Soft, moist, brown, SILT (ML); low plasticity, trace fine gravel, trace fine sand, trace wood fibers. (Fill)		
		100	G-1					*Becomes gray mottled at 5.5 feet.*		
507 / 10		64	SPT-2	1-7-50/3" (Refusal)				*10 - 11 feet: sample consists of approx. 50% wood fibers by volume.* *Auger refusal at 11.25 feet on basalt bedrock.*		Borehole completed at 11.25ft. below ground surface (bgs).
502 / 15										
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-28

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-29

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 19.0 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 517.3 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617301.00 E, 275320.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
								Base Aggregate - 3" thick (Fill)		
								Soft, moist, brown, SILT (ML); low plasticity, trace fine gravel, trace fine sand, trace wood fibers. (Fill)		
513		100	G-1							
5		20	SPT-1	1-0-2 (N=2)			ML			
		100	G-2							
508										
10		33	SPT-2	0-7-26 (N=33)				*Becomes wet at 10 feet.*		Auger grinding below 10 - 15 feet.
		100	G-3					BASALT; very weak, dark brown, highly weathered to decomposed (Little Butte Volcanic Series - Tholeiitic Basalt)		
		70	SPT-3	50/12" (Refusal)						
503										
15		98	SPT-4	26-50/5" (Refusal)				*Penetration rate decreases significantly at 15 feet; stronger rock inferred below this depth.*		Smooth, slow drilling below 15 feet.
		87	SPT-5	12-23-33 (N=56)				*Becomes dark blue-gray at 18 feet.*		
498										Borehole completed at 19ft. below ground surface (bgs).
20										
493										
25										
488										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-29

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-30

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 11.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 519.8 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617195.00 E, 275427.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
		100	G-1				ML	Moist, light brown, SILT with gravel (ML); low plasticity, fine to coarse angular gravel. (Fill)		
515 / 5		100	SPT-1	1-0-1 (N=1)			SM	Very soft, wet, light brown, Silty SAND (SM); fine to medium sand, low plasticity fines. (Fill)		
510 / 10		40	SPT-2	8-11-50/3" (Refusal)				*Basalt inferred below 11 feet.* *Auger refusal at 11.25 feet on basalt bedrock.*		Borehole completed at 11.25ft. below ground surface (bgs).
505 / 15										
500 / 20										
495 / 25										
490 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-30

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-31

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 12.7 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 520.8 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617173.00 E, 275391.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
								Base Aggregate - 1" thick (Fill)		
							ML	Moist, light brown, SILT with gravel (ML); low plasticity, fine to coarse angular gravel. (Fill)		
516 / 5		33	SPT-1	0-0-1 (N=1)			ML	Very soft, moist to wet, Sandy SILT (ML); fine to medium sand, low plasticity fines. (Fill)		
511 / 10		40	SPT-2	30-38-16 (N=54)				*Basalt inferred below 10 feet.*		Rod chatter begins at 9 feet and increases significantly below 10 feet.
		147	SPT-3	50/2" (Refusal)				*Auger refusal at 12.67 feet on basalt bedrock.*		Borehole completed at 12.67ft. below ground surface (bgs).
506 / 15										
501 / 20										
496 / 25										
491 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-31

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-32

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 10.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 530.4 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617027.00 E, 275515.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 6" thick (Pavement)		
								Base Aggregate - 2" thick (Fill)		
		100	G-1				ML	Moist, dark brown, SILT with gravel (ML); low plasticity, fine to coarse gravel. (Fill)		
526										
5		100	SPT-1	0-1-1 (N=2)			ML	Soft, moist, gray, SILT (ML); low plasticity, trace fine sand. (Fill) *Becomes gray at 4.5 feet.*		
521										Rod chatter below 9.5 feet bgs.
10		47	SPT-2	50/2" (Refusal)				*Auger refusal at 10.17 feet on basalt bedrock.*		Borehole completed at 10.17ft. below ground surface (bgs).
516										
15										
511										
20										
506										
25										
501										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-32

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-33

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 3.7 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 529.6 ft	
Location: See Figure 2 Site Plan	Coordinates: 7616945.00 E, 275701.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 5		100	G-1				GM	Moist, brown, Silty GRAVEL (GM); fine to coarse gravel, non-plastic fines. (Fill)		Strong rod chatter from ground surface to 3.5 feet bgs.
		0	SPT-1	50/2" (Refusal)				*Basalt inferred below 3.5 feet.* *Auger refusal at 3.67 feet on basalt bedrock.*		Auger bit grinding at 3.5 feet. Borehole completed at 3.67ft. below ground surface (bgs).
520 / 10										
515 / 15										
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-33

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-34

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 15.0 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 516.9 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617301.00 E, 275494.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
							GM	Base Aggregate - 2" thick (Fill)		
								Moist, brown, Silty GRAVEL (GM); fine to coarse gravel, low plasticity fines. (Fill)		
		100	G-1					Soft to very soft, moist, brown, SILT (ML); low plasticity, trace fine sand. (Fill)		
512 / 5		40	SPT-1	1-1-3 (N=4)			ML			
507 / 10		33	SPT-2	1-0-1 (N=1)				*Becomes very soft, grades to Silt with sand at 10 feet.*		
502 / 15		100	SPT-3	50/2" (Refusal)				*Auger refusal at 15 feet on basalt bedrock.*		Borehole completed at 15ft. below ground surface (bgs).
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-34

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-35

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 7.1 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 517.5 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617255.00 E, 275628.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Moist, dark gray and brown, Silty GRAVEL (GM); fine to coarse gravel. (Fill)		Rod chatter from ground surface to 5 feet bgs.
							ML	Soft, moist, brown, SILT (ML); low plasticity, trace fine sand. (Fill)		
513 5		60	SPT-1	0-1-2 (N=3)						
		0	SPT-2	50/1" (Refusal)				*Basalt inferred below 6 feet.*		Rod chatter and difficulty anvancing auger below 6 feet.
								Auger refusal at 7.08 feet on basalt bedrock.		Borehole completed at 7.08ft. below ground surface (bgs).
508 10										
503 15										
498 20										
493 25										
488 30										

McMILLEN JACOBS ASSOCIATES

Boring P-35

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-36

Date(s) Drilled: **11/22/2022**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Quinn**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **8.25" Hollow Stem Auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.6 ft**	
Hole Diameter: **8.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **516.77 ft**	
Location: **SE Corner of WWTP Site**	Coordinates: **7617443.00 E, 275286.00 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete - 6" thick (Pavement)		
								Base Aggregate - 6" thick (Fill)		
								Stiff, moist, brown with orange mottling, LEAN CLAY (CL); low to medium plasticity, trace coarse rounded gravel, trace fine sand. (Fill)		
		55	SPT-1	2-8-7 (N=15)						
-5 5								*Becomes medium stiff at 5 feet bgs.*		
		50	SPT-2	2-3-4 (N=7)			CL			
		60	SPT-3	50/5" (Refusal)				*Boulders/cobbles likely from 7.5 to 9.0 feet bgs.*		Slow, difficult drilling from 7.5 to 9 feet bgs.
								Becomes stiff at 9.0 feet bgs.		Drillers cracked auger transfer rod at approximately 8.5 feet bgs. Abandoned original boring at 8.5 feet bgs due to being off vertical alignment and moved about 4 feet west to re-drill boring.
-10 10		100	SPT-4	3-3-9 (N=12)				*Becomes gray with rootlets at 10 feet bgs.*		
								Basalt inferred below 10.75 feet bgs.		Difficult, slow drilling below 10.75 feet bgs. 30 minutes to advance from 10.75 to 11.5 feet bgs.
		800	SPT-5	50/0" (Refusal)						Borehole completed at 11.6ft. below ground surface (bgs).

McMILLEN JACOBS ASSOCIATES

Boring P-36

Appendix B

Rock Core Photos



BOREHOLE B-01, 3.5 TO 13.5 FEET



BOREHOLE B-05, 9.0 TO 16.3 FEET

McMILLEN JACOBS ASSOCIATES	**SWEET HOME WWTP SCHEMATIC DESIGN GEOTECHNICAL DATA REPORT**	**JULY 2022**
	CORE PHOTOGRAPHS	**FIGURE C - 1**



BOREHOLE B-05, 16.3 TO 23 FEET

Appendix C

Laboratory Test Results

Northwest Testing, Inc.
A Division of Northwest Geotech, Inc.
9120 SW Pioneer Court, Suite B, Wilsonville, Oregon 97070 | ph: 503.682.1880 fax: 503.682.2753 | www.nwgeotech.com

TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Report of: Atterberg limits, moisture content, and compressive strength of rock

Sample Identification

NTI completed Atterberg limits, moisture content, and compressive strength of rock testing on samples delivered to our laboratory on May 9, 2018 by a McMillen Jacobs Associates representative. Testing was performed in accordance with the standards indicated. Our laboratory test results are summarized on the following tables and attached pages.

Laboratory Test Results

Atterberg Limits (ASTM D 4318)			
Sample ID	**Liquid Limit**	**Plastic Limit**	**Plasticity Index**
B-3 S-2 @ 5 – 6.5 ft.	51	28	23
B-5 S-1 @ 2.5 – 4 ft.	44	28	16

Moisture Content of Soil (ASTM D 2216)	
Sample ID	**Moisture Content (Percent)**
B-3 S-2 @ 5 – 6.5 ft.	44.8
B-5 S-1 @ 2.5 – 4 ft.	26.3

Copies: Addressee

This report shall not be reproduced except in full, without written approval of Northwest Testing, Inc.

Northwest Testing, Inc.
A Division of Northwest Geotech, Inc.
9120 SW Pioneer Court, Suite B, Wilsonville, Oregon 97070 | ph: 503.682.1880 fax: 503.682.2753 | www.nwgeotech.com

TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Laboratory Testing

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-1 R-1 @ 5.2 – 6.3 ft.	2.41	4.88	100	25,302



Photo1: As received sample



Photo 2: Test sample before testing



Photo 3: Test sample after testing

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Laboratory Testing

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-5 R-1 @ 11.7 – 12.4 ft.	2.41	4.85	100	25,919



Photo1: As received sample

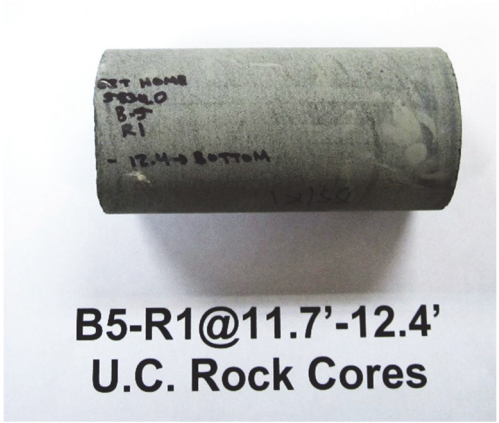


Photo 2: Test sample before testing



Photo 3: Test sample after testing

Laboratory Testing

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Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-5 R-2 @ 18 – 19 ft.	2.41	4.86	100	6932

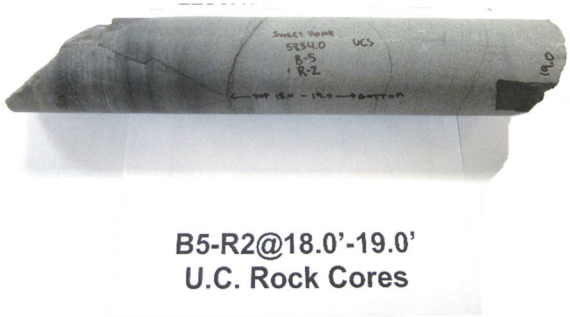


Photo1: As received sample

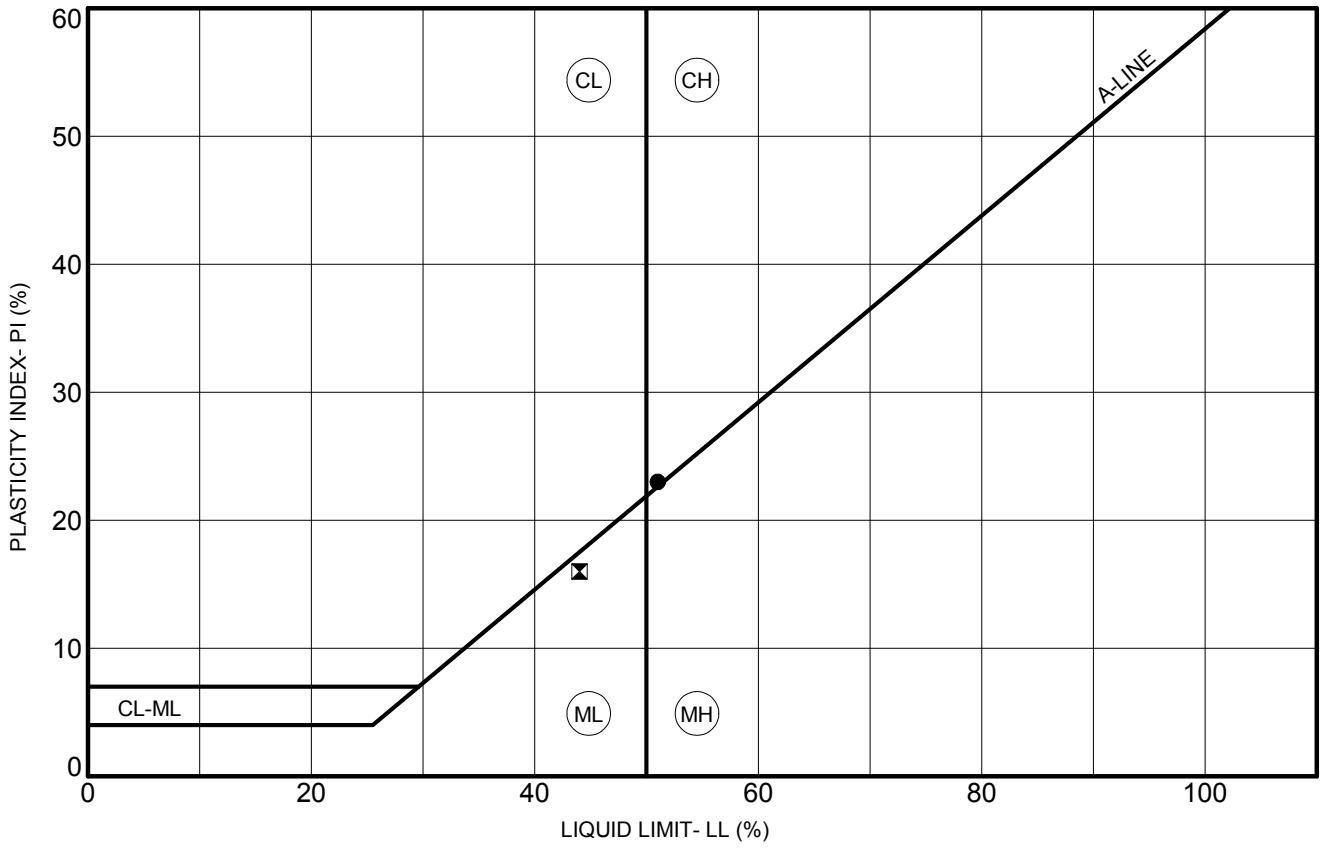


Photo 2: Test sample before testing



Photo 3: Test sample after testing

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	Sample ID	Depth (ft)	Moisture Content %	LL	PL	PI	% Pass #200	Classification
●	**B-03**	**5.0**	**(44.8)**	**51**	**28**	**23**		**CH**
⧓	**B-05**	**2.5**	**(26.3)**	**44**	**28**	**16**		**ML**

McMILLEN JACOBS ASSOCIATES

1500 SW 1ST AVE STE 750
PORTLAND, OR 97201
TELEPHONE: 503.384.2906

ATTERBERG LIMITS

Project: Waste Water Treatment Plant - Schematic Design
Number: 5834.0
Sample Location: Sweet Home
Testing Agency: Northwest Testing, Inc.

JA_ATTERBERG_PORTLAND OFFICE ADDRESS_5834.0 SWEET HOME.GPJ_JACOBS DATA TEMPLATE_GENERAL SOIL PROJECTS.GDT 6/11/18 REV-

Point Load Strength Index Test Results ASTM D-5731

PROJECT:	Sweet Home WWTP	**LAB SAMPLE NO.:**	
PROJECT NO.:	5834.0	**SAMPLE NO.:**	5834.0 - B-5
PROJECT LOCATION:	Sweet Home, OR	**SAMPLE DESCRIP:**	Basalt
SAMPLED BY:	Julia Irizarry	**DATE REPORTED:**	5/11/2018
DATE SAMPLED:	5/2/2018	**REPORTED BY:**	Devin Roth

Sample No.	Test Number	Test Type*	Rock Type	Width, W	Depth or Diameter, D	Failure Load, P	De^2	Point Load Strength Index, $I_{s(50)}$	Uniaxial Compressive Strength, UCS
				(in)	(in)	(lbs)	(in^2)	(psi)	(psi)
1	1	d	Basalt	5.31	2.36	5959	10313	513	12563
2	2	d	Basalt	5.91	2.36	3828	11459	304	7437
2B	3	d	Basalt	3.23	2.36	5158	6264	653	13717
3	4	d	Basalt	10.04	2.36	5104	19481	268	5098
3B	5	d	Basalt	5.59	2.36	6882	10848	569	13951
5	6	d	Basalt	6.69	2.36	8044	12987	579	13315
6	7	d	Basalt	5.12	2.36	4598	9931	407	9778
7	8	d	Basalt	4.13	2.36	6830	8021	714	17138
8	9	d	Basalt	11.42	2.36	8044	22154	383	9185
9	10	d	Basalt	5.20	2.36	7882	10084	690	14493
							Min	**268**	**5098**
							Max	**714**	**17138**
							Avg	**508**	**11667**

Size Corrected Point Load Index, $Is_{(50)}$

$I_{s(50)}$ = **508 psi** or **73,159 psf** or **3.5 MPa**

Mean Uniaxial Compressive Strength, σ_c

σ_c = **11,667 psi** or **1,680,111 psf** or **80 MPa**

*Test Type

d = diametral
a = axial
b = block
l= lump

Exhibit C

Sample AIS Forms

SAMPLE AIS CERTIFICATION LETTERS

The following information is provided as a sample letter of **step** certification for AIS compliance. Documentation must be provided on company letterhead.

<<Date>>

<<Company Name>>
<<Address>>
<<City State Zip>>

SUBJECT:

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxxx
2. Xxxx
3. Xxxx

Such process took place at the following location:

_____

If any of the above compliance statements change while providing material to this project, we will immediately notify the prime contractor and the engineer.

Sincerely,
<<Company Name>>

Name - *Signed by company representative*

Title

The following information is provided as a sample letter of certification for AIS compliance. Documentation must be provided on company letterhead.

<<Date>>

<<Company Name>>
<<Address>>
<<City State Zip>>

SUBJECT:

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxxx
2. Xxxx
3. Xxxx

Such process took place at the following location:

_____

If any of the above compliance statements change while providing material to this project, we will immediately notify the prime contractor and the engineer.

Sincerely,
<<Company Name>>

Name - *Signed by company representative*

Title

Mahler Water Reclamation Facility (MWRF) Interim Improvements

ADDENDUM NO. 2

FOR

SLUDGE BLEND TANK DESIGN-BUILD

To: All Prospective Bidders

The following clarifications, changes, additions and/or deletions are hereby made a part of the Contract Documents issued for the above referenced project as fully and completely as if the same were fully set forth therein.

This Addendum consists of 114 pages, including this cover page.

BIDDER QUESTIONS

Q1. What duration is the warranty bond required to be?
A1. The warranty bond shall cover a 5-year period that commences upon substantial completion. See item 1 below.

Q2. When will the site be available for site work to begin? The fence will need to be removed, the steel tank demolished and hauled off, a vault relocated and the filter bed removed. Do you see this happening before mid-late February?
A2. An additional addendum will be issued for demolition work and tree removal to be included as a part of this contract. The bid opening date is being extended, see items 4-6 below.

Q3. Will calculations for the handrailing system be required?
A3. Handrail calculations shall be required per specification 05 52 00 section 1.04.

Q4. Will other railing fittings be considered as approved equals?
A4. Equivalent railing fitting products will be considered after bid award as long as the products meet applicable codes and requirements. See specification 05 52 00 Handrail.

Q5. Will the Contractor be responsible for providing ultimate water tightness (hydraulic/leak) testing?
A5. Water tightness testing shall be a 2-step process:

1. Contractor shall be responsible providing water tightness (hydraulic/leak) testing of the tank with mechanical piping penetrations sealed per specifications 13 34 00 sections 1.03D, 3.05 and drawing sheet S-001. See item 3 below**.**
2. Contractor shall NOT be responsible for water tightness (hydraulic/leak) testing following installation of mechanical piping. Testing following mechanical piping installation shall be the responsibility of the Contractor completing those improvements following substantial completion of the new sludge blend tank.

Q6. Is the sack finish required on both the interior and exterior of the tank?
A6. Concrete finishes shall comply with drawing sheet S-001. Contractor shall notify the Owner's Engineer of Record about any repair areas prior to making repairs as noted on S-001. Sack finish of all concrete surfaces is not necessarily required, but may be required at areas with honeycombing, rock pockets, etc. Sack finish may be required for repairs described on S-001. The extent, size and location of repair areas will be determined by the Owner's Engineer-of-Record upon visual inspection.

CHANGES AND ADDITIONS AND/OR DELETIONS

Additions are shown in underline. Deletions are shown in strikeout.

1. EJCDC D-700 Article 6 Section 6.01B 1:

   Change: "The warranty bond period will extend to a date ~~one~~ five years after Substantial Completion of the Work."

2. Drawing Sheet S-001:

   Change: "WARRANTY: THE CONTRACTOR RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE REINFORCED CONCRETE RESERVOIR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ~~ONE~~ FIVE YEARS AFTER COMPLETION, ACCEPTANCE, TESTING AND FILLING OF THE RESERVOIR."

3. Specification 13 34 00 Reinforced Cast-in-Place Concrete Tank, section 3.05:

   Add: "E. See drawing sheet S-001."

4. EJCDC C-111 Advertisement for Bids
   Change: "Bids for the construction of the Project will be received at Sweet Home City Hall located at 3225 Main Street, Sweet Home, OR 97386, until January ~~10~~ 24, 2023 at 2:00 pm local time."

5. EJCDC C-430 Bid Bond (Penal Sum Form)
   Change: "Bid Due Date: January ~~10~~ 24, 2023"

6. Specification 00 43 37 – First-Tier Subcontractor Disclosure Form
   Change: "Bid Closing: January ~~10~~ 24, 2023 at 2:00 p.m.
   Disclosure Submittal Deadline: January ~~10~~ 24, 2023 at 4:00 p.m."

7. **Exhibit D, the December 2022 Geotechnical Engineering Report shall be added to the Contract Documents.**

End of Addendum No. 2

Mr. Greg Springman, Public Works Director — January 06, 2023 (Date)

Exhibit D

Geotechnical Engineering Report

City of Sweet Home
Mahler Water Reclamation Facility Improvements

Geotechnical Engineering Report

Final Submittal

McMILLEN JACOBS ASSOCIATES

Prepared for

WEST YOST
Water. Engineered.

December 2022

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Appendix A Boring Logs
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Acronyms and Abbreviations

ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
bgs	below ground surface
bpf	blows per foot
CDF	controlled density fill
CLSM	controlled low strength material
CSZ	Cascadia Subduction Zone
g	standard acceleration due to gravity
GDR	Geotechnical Data Report
GER	Geotechnical Engineering Report
H	height of buried wall
H_w	submerged portion of buried wall
IBC	International Building Code
$I_{S(50)}$	point load index
LBVS	Little Butte Volcanic Series
M	earthquake magnitude
MCE	maximum credible earthquake
MJA	McMillen Jacobs Associates
NHSMP	National Seismic Hazard Mapping Project
No.	number
N-value	standard penetration test blows to advance final foot
OAR	Oregon Administrative Rules
ODOT	Oregon Department of Transportation
OSHA	Occupational Safety and Health Administration
OSSC	Oregon Structure Specialty Code
PGA	peak ground acceleration
pci	pounds per cubic inch
psi	pounds per square inch
RMR	Rock Mass Rating
RQD	Rock Quality Designation
SEI	Structural Engineering Institute
SPT	Standard Penetration Test
USGS	United States Geological Survey
West Yost	West Yost Associates, Inc.
WRF	Wastewater Reclamation Facility

Distribution

To: Preston Van Meter, P.E.
West Yost Associates, Inc.

From: Wolfe Lang, P.E., G.E.
McMillen Jacobs Associates

Prepared By: Jeff Quinn, P.E.
McMillen Jacobs Associates

Reviewed By: Wolfe Lang, P.E., G.E.
McMillen Jacobs Associates

Revision Log

Revision No.	Date	Revision Description
Final Submittal	July 22, 2022	Final Submittal to West Yost
Final Submittal, Rev. No. 1	December XX, 2022	Final Submittal Incorporating Site Revisions

1.0 Introduction

1.1 General

McMillen Jacobs Associates (MJA) has been retained by West Yost Associates, Inc. (West Yost) to provide geotechnical engineering services for the City of Sweet Home Mahler Water Reclamation Facility Improvements project. The project owner is the City of Sweet Home. The Project site location is shown in the Vicinity Map, Figure 1. This Geotechnical Engineering Report (GER) presents the results of our field explorations, laboratory testing, geotechnical analyses, and design and construction recommendations. Detailed discussions of site explorations, site geology, and laboratory testing is summarized in a Geotechnical Data Report (GDR) prepared by MJA, dated July 2022.

1.2 Project Description

The City of Sweet Home Mahler Water Reclamation Facility (WRF) is located at 1357 Pleasant Valley Road, in Sweet Home, Oregon. The WRF has been in service since 1947 with two major upgrades completed in 1974 and 1994 (Brown & Caldwell, 2016). Our project understanding is based on our communication with West Yost and the 90 percent submittal plans entitled *Mahler Water Reclamation Facility Improvements Project – Phase 1*, dated June 2022, prepared by West Yost. The proposed WRF improvements are shown in Figure 2. We were not provided with structural loading information for the above WRF improvements. We understand the WRF is to remain operational during construction of the proposed improvements.

The proposed WRF improvements include the following:

- *Main Electrical and Blower (MEB) Building*: The 22- by 67.5-foot MEB Building will be located within the north-central part of the WRF site. The interior of the building will be supported on a 6-inch-thick slab on grade foundation, while the perimeter of the structure will be supported on a 1.5-foot-wide continuous spread footing. A new generator, which will be installed on the north side of the MEB Building, will be supported on 12- by 28-foot, 12-inch-thick reinforced concrete slab on grade with thickened edges. Site grades will be raised up to approximately 6 feet in this area to facilitate construction of the MEB Building, with approximately 4 to 6 feet of fill placed below the building footprint. The approximately 6-foot-tall fill slope on the east side of the MEB Building will descend at 2H:1V (horizontal:vertical).
- *Influent Pump Station (IPS)*: The new, 40- by 56-foot IPS will be constructed just north of the existing IPS, within the southeast corner of the WRF site. The approximate southern half of the IPS structure, which supports above-grade piping, will be supported on a 12-inch-thick reinforced concrete slab on grade with thickened edges. The approximate northern half of the IPS structure, which houses five submerged pumps, will be supported on a 28-inch-thick reinforced concrete slab with a base elevation of approximately 491.2 feet (e.g., about 26.2 feet below grade).
- *Sludge Blend Tank*: The new, 28-foot diameter sludge blend tank will be constructed in the southeast corner of the WRF site just east of the solids building. The sludge blend tank will be

approximately 25 feet tall and will be supported on a 1.5-foot-thick, reinforced concrete mat foundation with a base elevation of approximately 515.3 feet (e.g., about 1.5 feet below grade).

- *Digested Sludge Holding Tank*: The new, 36-foot diameter sludge blend tank will be constructed in the southeast corner of the WRF site just north of the sludge blend tank. The sludge blend tank will be approximately 26 feet tall and will be supported on a 1.5-foot-thick, reinforced concrete mat foundation with a base elevation corresponding to approximately 1.5 feet below grade.
- *Solids Building Expansion*: The existing solids building will be enlarged from its existing 22- by 37-foot plan dimensions to approximately 32- by 57-foot plan dimensions and will be supported on a shallow foundation system consisting of perimeter footings and an interior slab-on-grade.
- *40*-foot Diameter Digestor: The new digestor will be constructed within the footprint of the existing, approximately 55-foot diameter digestor (DG1) in the southeast corner of the WRF site. We understand that the existing foundation will be used to support the new digestor structure.
- *Temporary Generator*: A temporary electrical generator, supported on an 18-inch-thick reinforced concrete slab, will be installed on the south side of existing Secondary Clarifier SC60.
- *Existing Bathroom Relocation*: The existing bathroom, currently along the northern fence line and east of the existing entrance gate, will be moved to the north side of the boat ramp access road.
- *Retaining Walls*: To support new fills placed for site grading, as well as proposed cuts, there are six retaining walls (designated Wall 1 through Wall 6) proposed as part of the improvements. The retaining walls will be cast-in-place, reinforced concrete cantilevered walls ranging in height from 2.5 to 6.75 feet.
- *Existing Structures/Facilities to Remain In Use*: Secondary Clarifier Nos. 1 through 3; RAS/WAS Pump Station; Aeration Basin; Chlorine Contact Chamber; Administration and Operations Building; Sand Filters; Lime Silo; and the electrical building on the south side of existing SC60.
- *Proposed Piping Improvements*: 12-inch storm drain;10-inch storm drain; 8-inch to 36-inch sanitary sewer; 12-inch IPS forcemain to headworks (HDPE pipe); 24-inch RS IPS to Headworks (HDPE pipe); 6-inch PS forcemain; 12-inch RDPS; 6-inch SL-WAS; 6-inch SL-D forcemain; 4-inch PSC; and 10-inch DIP waterline relocation.
- *Demolition of the Following Existing Structures*: Backwash Storage; Waste Backwash Storage; the approximately 25- by 50-foot storage building on the west side of the WRF site; and several buildings clustered together in the central portion of the WRF site including the carport, an approximately 40- by 40-foot CMU building, an approximately 25- by 50-foot Quonset Hut storage building, and an approximately 15- by 35-foot shed.
- *Primary Clarifier*: The new primary clarifier will consist of an approximately 65- by 85-foot reinforced concrete tank structure. The base depth of the new primary clarifier will be approximately 9.5 to 22.5 feet below existing site grades and will be supported on an 18-inch-thick, reinforced concrete mat foundation system. The primary clarifier will be expanded to the north (designated Primary Clarifier 4) at a future date.
- *Secondary Clarifier 90 (SC90)*: SC90 will consist of an approximately 95-foot diameter, 17-foot-tall reinforced concrete tank structure. SC90 will be a primarily below-grade structure, with the tank walls being about 2 feet above finish grade. The base depth of the SC90 will be

approximately 15 feet below existing site grades and will be supported on a reinforced concrete mat foundation.

- *Building A (O&M and Controls)*: This 40- by 120-foot building, oriented northeast-southwest, will be constructed at the west end of the WRF site and will be an at-grade structure supported on an interior slab-on-grade. The perimeter of the structure and interior load-bearing walls will be supported on shallow spread footings.
- *Building A (Headworks and Dewatering)*: This 40- by 120-foot building, oriented southeast-northwest, will abut the southeast corner of the O&M and Controls building to form the leg of the L-shaped Building A. This will be an at-grade structure supported on an interior slab-on-grade. The perimeter of the structure and interior load-bearing walls will be supported on shallow spread footings.
- *SC90 WAS and RAS Pump Stations*: Each of these two pump stations will be an approximately 10-foot diameter reinforced concrete vault structure with a base depth of approximately 16.5 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Existing Secondary Clarifier SC60 RAS/WAS Pump Station*: This pump station will be an approximately 10- by 20-foot reinforced concrete vault structure with a base depth of approximately 12.5 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Aeration Basin No. 3*: Aeration Basin No. 3 will consist of an approximately 40- by 75-foot reinforced concrete structure. The base depth of Aeration Basin No. 3 will be approximately 13 to 18 feet below existing site grades and will be supported on a reinforced concrete mat foundation. Aeration Basin No. 3 will be expanded to the north (designated Aeration Basin No. 4) at a future time and will likely be founded at the same depth as Aeration Basin No. 3.
- *Tertiary Filters*: The tertiary filters will be housed in an approximately 25- by 35-foot reinforced concrete tank structure. The base depth of Aeration Basin No. 3 will be approximately 18 feet below existing site grades and will be supported on a reinforced concrete mat foundation.
- *Tertiary Building, UV Disinfection, and UW Storage*: These facilities will be located adjacent to one another within an approximate 35- by 40-foot area. The UW Storage and UV Storage facilities will be constructed within the existing chlorine contact chamber. The portion of the Tertiary Building housing the utility water pumps will likely be approximately 7 feet below existing site grades.
- *Outfall*: The outfall pipe leads from the UV disinfection chamber to the South Santiam River. This will be part of a future project phase.
- *Other Improvements*: The approximate western half of the WRF site, an area north of the boat ramp access drive, and a narrow area along the south site boundary will be surfaced with gravel. In addition, new asphalt pavements along the entrance road from Pleasant Valley Road and within most of the WRF site; new concrete curbs and sidewalks; two new entrance gates; and a new chain-link fence.

1.3 Purpose and Scope of Work

The purpose of this investigation was to characterize the subsurface conditions at the site and develop geotechnical design recommendations for the proposed project. Specifically, our scope of work included the following:

- Assess soil seismic profile (site classification) and parameters in accordance with the 2019 Oregon Structure Specialty Code (OSSC) to support structural design. If the site is potentially liquefiable, the soil seismic profile will be only for the facilities with seismic periods less than 0.5 second.
- Evaluate the liquefaction potential and liquefaction-induced effects, such as seismic-induced settlements, lateral spreading, and potential reduction in soil bearing capacity.
- Evaluate static and seismic soil bearing capacity, subgrade modulus, and total and differential settlements for the proposed foundations and facilities.
- Provide recommendations and design criteria for shallow foundation systems.
- Provide static and seismic lateral earth pressure recommendations for the embedded walls of the proposed structures.
- Provide lateral load resistance recommendations, including passive earth pressure and coefficient of friction.
- Provide recommendations for shoring and dewatering of deep excavations.
- Provide recommendations for site preparation, grading, drainage, and wet-weather earthwork procedures.
- Provide engineered fill recommendations and compaction criteria for the foundations.

2.0 Field and Laboratory Investigation

2.1 Subsurface Exploration

Initial exploratory borings were completed by Western States Soil Conservation (WSSC) of Hubbard, Oregon using a truck-mounted CME-75 drill rig. The explorations were completed between April 30 and May 2, 2018. This exploration program included advancing five boreholes, designated B-1 through B-5, and fifteen probe-holes, designated P-01 through P-15. The boreholes were advanced using mud-rotary drilling and HQ rock coring techniques to depths ranging from 5.8 to 23 feet bgs. The probe-holes were advanced using hollow-stem auger drilling techniques and extended to between 2.5 and 15 feet bgs (top of bedrock).

Additional air-track probe holes were advanced on October 29, 2019 by McCallum Rock Drilling of Salem, Oregon using a Furakawa 900 track-mounted drill rig. This exploration program included advancing 12 air-track probe holes (designated P-16 through P-27) to depths ranging from 11 to 26 feet bgs.

On June 20, 2022, eight additional probe-holes (designated P-28 through P-35) were advanced by PLI Systems of Hillsboro, Oregon using a truck-mounted Mobile B59 drill rig. The probe-holes were advanced using hollow-stem auger drilling techniques and extended to between 3.7 and 19 feet bgs.

On November 22, 2022, one additional probe-hole (designated P-36) was advanced by WSSC using a truck-mounted CME-75 drill rig. P-36 was advanced using hollow-stem auger drilling techniques and extended to 11.5 feet bgs.

Details of the exploration and sampling intervals are provided in the project GDR (McMillen Jacobs, 2022). The exploration locations are shown in Figure 2 and the exploration logs are provided in Appendix A.

2.2 Piezometers

Two-inch diameter piezometers were installed in two boreholes to allow for long-term, stabilized groundwater level measurements. Piezometers were installed in the following boreholes:

- Boring B-3, screened between 9 and 12 feet bgs.
- Boring B-5, screened between 5.5 and 8.5 feet bgs.

2.3 Laboratory Testing

Field samples obtained from exploratory borings were delivered to the MJA Portland office for further examination and storage. Each of the samples was re-examined and compared to the field boring log description to confirm the field classifications and maintain consistency. Representative samples were then selected for laboratory testing. Testing was performed on soil and rock samples from boreholes B-1,

B-3, and B-5. The laboratory test results are provided in Appendix B. The laboratory testing included the following index and strength property tests, performed in accordance with relevant ASTM standards:

- Moisture content analyses (ASTM D 2216).
- Atterberg limits tests (ASTM D 4318).
- Point load tests of rock core (ASTM D 5731).
- Unconfined compressive strength of intact rock core (ASTM D 7012).

Point load testing was performed by MJA. All other laboratory testing was performed by Northwest Testing, Inc. of Wilsonville, Oregon. Laboratory test results are presented in Appendix B.

3.0 Site Conditions

3.1 Site Description

The site is currently occupied by the existing WRF, located on the south bank of the South Santiam River near its confluence with Ames Creek. The site is fenced around its perimeter and is bordered by the Albany and Eastern railroad tracks to the south, a boat ramp access road to the north (and the South Santiam River beyond), a private property to the west, and Ames Creek to the east. In general, the site slopes gently from the west to the east (i.e., towards Ames Creek) and gently from the south to the north (i.e., towards the South Santiam River). The eastern two-thirds of the site (in which the existing aeration basin and the clarifiers are located) is situated on a relatively level terrace that generally sits 5 to 7 feet lower than the western one-third of the site and approximately 10 feet above Ames Creek to the east.

A paved access road runs along the north side of the site, from the Pleasant Valley Road WRF entrance at the west end of the site to the boat ramp and recreation use area at the north-northeast end of the site. The paved WRF road, heading south from the access road from the main entrance gate, provides access to the main areas within the WRF. Bedrock is exposed along the South Santiam River and Ames Creek approximately 100 feet to the north-northeast of the site. Exposed bedrock on the riverbank slopes steeply into the river.

3.2 Geological Setting

The project is located in the foothills of the Western Cascades, a north-south trending physiographic region that stretches from northern California to British Columbia, tucked between the Willamette Valley to the west and the younger High Cascades to the east. The Western Cascades in Oregon were formed by a series of volcanic events from approximately 35 to 17 million years ago. The region is marked by densely forested hills dissected by the region's many rivers (Madin, 1990; Schlicker and Deacon, 1967; Wilson, 1998; Popowski, 1996). A detail description of the geological setting of the site is described in the project GDR (McMillen Jacobs, 2019).

3.3 Subsurface Conditions

The materials encountered in the explorations were grouped into three geotechnical units: Pavement, Fill, and Basalt (Little Butte Volcanic Series – Tholeiitic Basalt). These units have been defined by their geologic origin, stratigraphic position, engineering properties, and their distribution in the subsurface. Variations in subsurface conditions may exist between the locations of the borings. Contacts between the units may be more gradational than shown in the boring logs in Appendix A. The SPT N-values, shown on the boring logs and discussed below, are reported as counted in the field (uncorrected). Photos of rock core samples are provided in Appendix C. Cross sections of subsurface conditions are shown in Figures 3A through 3F. The following sections describe each geotechnical unit in greater detail.

3.3.1 Pavement

Asphalt concrete (AC) was encountered in 12 borings, as described in the boring logs in Appendix A. The AC pavement ranged from about 4 to 6 inches in thickness and was typically underlain by about 4 inches of crushed rock base. Portland Cement Concrete (PCC) pavement was encountered in three borings (B-1,

P-27, and P-36). In B-1, the PCC pavement was about 18 inches thick and underlain by about 12 inches of crushed rock base. In P-27 and P-36, the PCC pavement section was about 6 inches thick.

3.3.2 Fill

Undocumented fill materials were present in all the explorations and were likely placed for site grading and development. We observed highly variable fill depths across the site, extending from the existing ground surface to depths ranging from 2 to 16.5 feet bgs. Additionally, the fill depths often varied considerably over short distances. The fill was underlain by bedrock, and generally consisted of silt with variable amounts of organics, lean to fat clay with variable amounts of sand and gravel, sand and gravel with variable amounts of silt and clay, and organic soil with variable amounts of sand. Undocumented fill refers to materials placed without (available) records of subgrade conditions or evaluation of compaction. Standard Penetration Tests (SPTs) conducted within the fill yielded N-values ranged from 0 to 45 blows per foot (bpf). The higher N-values were generally recorded at the fill-bedrock contact.

3.3.3 Boulders

Based on drilling action and slow advancement rates, we believe that large cobbles or boulders were encountered between 7.5 to 9 feet bgs in boring P-36, located in the southeast corner of the WRF site.

3.3.4 Basalt - Little Butte Volcanic Series Tholeiitic Basalt

The Little River Butte Volcanic Series (LRBV) in the project area consists of tholeiitic basalt and is bedrock in this area. The basalt was encountered beneath the fill in all the explorations. The depth to the LRBV ranged from 2.0 feet to 16.5 feet bgs.

The unconfined compressive strength of the basalt varied between approximately 7,000 psi and 26,000 psi with an average value of approximately 19,000 psi. The results of point load tests indicate that the Point Load Index ($I_{S(50)}$) of the basalt ranged between approximately 270 psi and 715 psi, with an average value of 510 psi. We suspect the lower value of unconfined compressive strengths may correspond to failure along the weak planes. Definition of rock strength and depth to bedrock at each exploration are provided in Table 3-1 and Table 3-2, respectively. The basalt characteristics are discussed in more details in Section 3.4. The depth to bedrock is also included on the geologic cross sections shown in Figures 3A through 3F.

Table 3-1. Definition of Rock Strength Descriptions

Grade[1]	Approximate Uniaxial Compressive Strength (psi)	Qualitative Description
R0	35 – 150	Extremely Weak
R1	150 – 700	Very Weak
R2	700 – 3,600	Weak
R3	3,600 – 7,200	Medium Strong
R4	7,200 – 14,500	Strong
R5	14,500 – 36,000	Very Strong
R6	>36,000	Extremely Strong

[1] Rock strength grades from Brown (1981).

Table 3-2. Depth of Fill / Depth to Rock Summary

Exploration ID	Associated Structure(s)	Ground Surface Elevation (feet)	Depth to Rock (feet)	Rock Surface Elevation (feet)
B-1	--	516.5	2.5	514.0
B-2	SC90 WAS Pump Station	518.3	16.5	501.8
B-3	Primary Clarifier	529.9	11	518.9
B-4	Building A – O&M & Controls	538.6	4.5	534.1
B-5	MEB Building	528.8	8.5	520.3
P-01	--	517.3	11	506.3
P-02	--	526.1	11.5	514.6
P-03	Primary Clarifier	530.4	16	514.4
P-04	Building A – Headworks & Dewatering	530.8	7.5	523.3
P-05	Building A – Headworks & Dewatering	533.1	3.5	529.6
P-06	Building A – O&M & Controls	536.2	3.5	532.7
P-07	--	538.0	2.5	535.5
P-08	Building A – O&M & Controls	535.3	7.5	527.8
P-09	--	530.5	4	526.5
P-10	--	530.1	5.5	524.6
P-11	MEB Building	529.8	5.5	524.3
P-12	MEB Building	526.4	5	521.4
P-13	Future Aeration Basin No. 4	523.6	8.5	515.1
P-14	Aeration Basin No. 3	521.7	5.5	516.2
P-15	--	519.1	2.5	516.6
P-16	IPS	517.1	12.0	505.1
P-17	--	516.5	6.0	510.5
P-18	SC90, SC60 RAS/WAS Pump Station	518.5	9.0	509.5
P-19	--	518.0	6.0	512.0
P-20	SC90 RAS Pump Station	525.4	8.0	517.4
P-21	Primary Clarifier, Aeration Basin No. 3	521.8	6.0	515.8
P-22	Aeration Basin No. 3	518.5	7.0	511.5
P-23	Primary Clarifier	530.4	15.0	515.4
P-24	MEB Building	529.7	3.0	526.7
P-25	Future Outfall	506.4	2.0	504.4
P-26	Future Outfall	507.2	3.0	504.2
P-27	--	516.6	10.0	506.6
P-28	IPS	516.5	11.0	505.5
P-29	IPS	517.3	12.5	504.8
P-30	SC90	519.8	11.0	508.8
P-31	SC90	520.8	10.0	510.8
P-32	Primary Clarifier, Future Primary Clarifier No. 4	530.4	10.0	520.4
P-33	Future Outfall	529.6	3.5	526.1
P-34	Tertiary Filters	516.9	15.0	501.9
P-35	-	517.5	6.0	511.5
P-36	Sludge Blend Tank	516.8	10.8	506.0

3.4 Rock Mass Classification

Two rock mass classification systems, Rock Quality Designation (RQD) and Rock Mass Rating (RMR), were used to evaluate and characterize rock mass conditions for providing recommendations regarding ground behavior, excavation methods, and design of the embedded walls. These classifications were originally developed for tunneling but are useful in estimating rock excavatability.

3.4.1 Rock Quality Designation (RQD)

RQD values are a modified core recovery in which only core lengths equal to or longer than 4 inches are measured in an individual core run (Bieniawaski, 1989). RQD values are presented on the boring logs in Appendix A. The RQD ranged from 42 to 86 percent, indicating "poor" to "good" rock quality, with an average RQD of 67 percent, indicating a "fair" condition of the rock.

3.4.2 Rock Mass Rating (RMR) System

The RMR (Bieniawaski, 1989) is a rating system that considers six numerical rock mass inputs including: strength of intact rock, RQD, discontinuity spacing, condition of discontinuities, orientation of discontinuities relative to excavation, and groundwater conditions. An RMR range of 60 to 70 was estimated for the encountered conditions, indicating a "good" rock condition. RMR calculation sheets summarizing input and results are included in Appendix D.

3.5 Groundwater

Groundwater observation wells were installed in borings B-3 and B-5. Initial groundwater levels recorded on May 2, 2018, with subsequent levels recorded on October 29, 2019, and June 20, 2022. We also observed groundwater in nine other exploration locations, as summarized in Table 3-3. Groundwater levels are noted on the boring logs in Appendix A.

Groundwater levels may vary with precipitation, the time of year, and/or other factors. Generally, groundwater highs occur near the end of the wet season in late spring and groundwater lows occur near the end of the dry season in the early fall.

Table 3-3. Groundwater Level Measurements

Boring ID	Piezometer	Borehole Elevation (feet)	Depth to Groundwater (feet)			Groundwater Elevation (feet)		
			May 2, 2018	Oct 29, 2019	June 20, 2022	May 2, 2018	Oct 29, 2019	June 20, 2022
B-2	No	518.3	2.5	-	-	515.8	-	-
B-3	Yes	529.9	2.9	3.6	8.2	527.0	526.3	521.7
B-4	No	538.6	2.0	-	-	536.6	-	-
B-5	Yes	528.8	5.0	7.0	6.8	523.8	521.8	522.0
P-03	No	530.4	8.5	-	-	521.9	-	-
P-09	No	530.5	3.0	-	-	527.5	-	-
P-13	No	523.6	6.0	-	-	517.6	-	-
P-15	No	519.1	2.5	-	-	516.6	-	-
P-29	No	517.3	-	-	10.5	-	-	506.8
P-31	No	520.8	-	-	9.2	-	-	511.6
P-32	No	530.4	-	-	9.7	-	-	520.7

4.0 Seismic and Geologic Hazard Evaluation

4.1 General

The seismic hazards evaluation was performed in general accordance with the 2019 Oregon Structure Specialty Code (OSSC, 2019) and ASCE's Minimum Design Loads for Buildings and Other Structures, 2016 Edition (ASCE/SEI 7-16). The OSSC requires evaluating the seismic hazards for the Maximum Credible Earthquake (MCE) having a 2% probability of exceedance in a 50-year period (2,475-year return period).

4.2 Regional Seismicity

The Pacific Northwest is a seismically active region that has three principal seismic sources: (1) the Cascadia Subduction Zone (CSZ) megathrust, which represents the interface between the subducting Juan de Fuca plate and the overriding North American plate; (2) faults located within the Juan de Fuca plate (referred to as CSZ intraplate or intraslab sources); and (3) crustal faults principally in the North American plate (Wong and Silva, 1998).

4.3 Site Classifications

The project site was assigned a seismic site class following code-based procedures in ASCE/SEI 7-16, Chapter 20 (2016). Site class is used to categorize common subsurface conditions into broad classes to which ground motion attenuation and amplification effects are assigned. Site class accounts for the conditions encountered in the upper 100 feet of the subsurface profile. Shallow bedrock was encountered during the subsurface investigation and most of the structures are anticipated to be supported on the bedrock. Therefore, a Site Class B is appropriate for design purposes.

4.4 Seismic Design Parameters

The 2019 OSSC requires that spectral response accelerations be developed based on the ASCE 7-16. We developed spectral response accelerations using the online ASCE 7 Hazard Tool, which references ground motion procedures in accordance with ASCE 7-16 and is based on the USGS 2014 National Seismic Hazard Mapping Project (NSHMP) developed for the Maximum Considered Earthquake (MCE) (Peterson et. al., 2014). The MCE consists of ground motions (accelerations) with a 2-percent probability of exceedance in 50 years (return period of 2,475 years). The recommended spectral acceleration parameters for use in structural design are provided in Table 4-1. For pipeline design we recommend using a Peak Ground Velocity (PGV) of 10 inches per second.

Table 4-1. 2019 OSSC MCE Spectral Acceleration Parameters for Site Class B

Parameter	0.2 Second	1 Second
Mapped MCE_R (Rock site)	S_S = 0.63 g	S_1 = 0.34 g
Site Coefficients	F_a = 0.9	F_v = 0.8
Site-Adjusted MCE_R	S_{MS} = 0.57 g	S_{M1} = 0.27 g
Design MCE_R	S_{DS} = 0.38 g	S_{D1} = 0.18 g
Mapped MCE_G PGA (Rock Site)	0.29 g	
Site Coefficient F_{PGA}	0.9	
Site-adjusted MCE_G PGA	0.26 g	

4.5 Liquefaction

4.5.1 Overview

Liquefaction is a phenomenon affecting saturated, granular soils in which cyclic, rapid shearing from an earthquake results in a drastic loss of shear strength and a transformation from a granular solid mass to a viscous, heavy fluid mass. The results of soil liquefaction include loss of shear strength, loss of soil materials through sand boils, flotation of buried chambers/pipes, and post liquefaction settlement.

4.5.2 Liquefaction Hazard

The Project site is underlain by competent basalt bedrock, encountered at shallow depths, overlain by variable amounts of fill. However, there are localized areas of the site that are underlain by fill extending to depths up to about 16.5 feet bgs, as indicated in Table 3-2. Our liquefaction analyses indicated that the loose/soft fill materials below the groundwater table are potentially liquefiable. Since the fill materials are not laterally continuous, widespread soil liquefaction is not considered to be a hazard at the site.

Anticipated foundation conditions for the proposed structures are summarized in Table 6-1. The excavations required to facilitate construction of the below-grade structures will effectively remove the potentially liquefiable soils and these structures will be founded on basalt bedrock. Therefore, the risk of liquefaction is negligible for the below-grade structures. For the at-grade structures (i.e., Building A and the MEB Building), the total anticipated liquefaction-induced settlement is on the order of 1 inch with differential settlement on the order of ½ inch and occurring across the slab-on-grade foundation and across the long axis of these buildings. For the IPS, the approximate southern half of which will be supported on a slab-on-grade foundation, we anticipate the total liquefaction-induced settlement will be on the order of 1 inch, with differential settlement on the order of ½ inch and occurring across the slab-on-grade foundation.

We evaluated liquefaction susceptibility using SPT-based methods presented by Boulanger and Idriss (2014), as well as Idriss and Boulanger (2008). Our analyses considered the aggregate seismic event (or MCE), a design-level event that considers the cumulative effect from all seismic sources in the region for

the indicated probability of exceedance (i.e., 2 percent in 50 years). The spectral acceleration parameters for the MCE are summarized in Table 4-1. Estimating the ground surface PGA was accomplished using aggregated probabilistic data for design-level earthquakes available at the USGS Unified Hazard Tool website. The resulting aggregate seismic event used in our liquefaction susceptibility and settlement analyses had an earthquake magnitude of 8.3 and peak ground acceleration (PGA) of 0.29 g. Groundwater was modeled as the seasonal high level at each boring/probe location, based on groundwater measurements and observations discussed in Section 3.5.

4.6 Other Seismic Hazards

Due to the shallow bedrock and overall gently-sloping site, we conclude that other seismic hazards are negligible. These seismic hazards include seismically-induced landslides, liquefaction (apart from the localized areas discussed above), lateral spreading, ground motion amplification, and surface rupture. The nearest Class A fault mapped by the USGS is the Owl Creek Fault, located approximately 25 miles west of the site. Therefore, fault rupture is not considered a hazard to the project.

5.0 Conclusions and Key Geotechnical Considerations

Based on the results of our field explorations and analyses, the site can be developed as described in Section 1.2 of this report, provided the recommendations presented in this report are incorporated into the design and development. We conclude the primary geotechnical considerations are the presence of highly variable and weak undocumented fill materials and the associated excessive settlement of the at-grade structures due to static and seismic loading. Other important considerations for the Project include the presence of shallow groundwater and shallow strong to very strong basalt bedrock.

5.1 Settlement Potential of At-Grade Structures

Due to the presence of highly variable undocumented fill materials across the site, we conclude there is a risk for uneven subgrade response from structural loads for at-grade structures. Adverse effects resulting from uneven subgrade response of the soils could take the form of excessive total and differential static settlement and/or bearing capacity failure. In addition, there is the potential for localized liquefaction-induced settlement within the undocumented fill materials below the at-grade structures. Therefore, we do not recommend the proposed at-grade structures (discussed in Section 1.2) be supported by shallow spread footing, slab-on-grade, or mat foundations without subgrade improvement in the form of the over-excavation of a minimum of 3 feet of undocumented fill. For the critical structures, such as the IPS and MEB Building, complete over-excavation of the undocumented fill and replacement with compacted structural fill are recommended to mitigate potential static and liquefaction-induced settlements. For the Sludge Blend Tank and the Digested Sludge Holding Tank, we recommend that the undocumented fill materials be over-excavated to 5 feet bgs and replaced with a crushed rock mat section.

Foundation recommendations for mitigating excessive settlement for the at-grade structures are presented in Section 6.2 and in Section 6.3 for the Sludge Blend Tank and the Digested Sludge Holding Tank.

5.1.1 Liquefaction-Induced Settlement

Potentially liquefiable soil is present in isolated areas (i.e., where undocumented fill materials are present) below the proposed at-grade structures. As discussed in Section 4.5, the results of our liquefaction-induced settlement analyses indicated up to 1 inch of total vertical settlement, and about ½ inch of differential settlement for the portion of the IPS supported on a slab-on-grade foundation, as well as for the MEB Building and Building A.

5.1.2 Static Settlement

Building A: Below the Building A footprint, the undocumented fill extends to depths ranging from 2.5 to 7.5 feet and are generally less than 4.5 feet. We estimated that about ½ to 1½ inch settlement may develop within the building footprint with the differential settlement of about 1 inch across the building. For Building A, we recommend to over-excavate of a minimum of 3 feet of undocumented fill and replace with compacted structural fill. This will reduce the total static settlement to less than 1 inch and differential settlement to less than ½ inch.

IPS Structure: The portion of the IPS that will be supported on a slab-on-grade foundation is underlain by 8 to 12 feet of soft, predominately fine-grained fill materials which may develop up to about 2 inches of

static settlement. The adjacent portion of the IPS will be founded at a depth of about 26 feet on hard basalt bedrock and is not expected to develop any settlement. Therefore, there is the potential for up to 2 inches of differential settlement between the at-grade and below-grade portions of the IPS, which could affect structural performance as well as excessive movement of the pipes and their connections. We recommend complete over-excavation of the undocumented fill materials below the at-grade portion of the IPS to mitigate the potential for static differential settlement.

MEB Building: About 4 to 6 feet of fill will be placed below the MEB Building footprint to achieve the desired finish grade. The fill placement will induce stress increases (up to approximately 800 psf) on the soft, compressible fill materials that extend up to about 8.5 feet below existing site grades below the MEB Building footprint. We anticipate consolidation settlement on the order of 3 inches may occur due to the fill placement, with differential settlement of up to 1½ inches across the building. To mitigate the potential for total and differential static settlement, we recommend complete over-excavation of the undocumented fill materials below the MEB Building prior to mass grading operations.

Sludge Blend Tank and Digested Sludge Holding Tank: The 28-foot diameter Sludge Blend Tank and the 36-foot diameter and the Digested Sludge Holding Tank are underlain by undocumented fill materials extending to about 10.75 feet bgs, based on boring P-36. The proposed bottom-of-slab depths for both tanks is approximately 1.5 feet bgs (i.e., at-grade structures). If founded on existing conditions, settlements of the tanks will likely range from about 2 to 2.5 inches, and differential settlement ranging from 1 to 1.25 inch. To reduce respective total and differential settlements to less than 1 inch and ½ inch, we recommend the undocumented fill materials be over-excavated to 5 feet bgs and replaced with a reinforced crushed rock section as discussed in Section 6.3.

5.2 Shallow Groundwater

Due to the presence of shallow groundwater at the subject site, we anticipate temporary excavations will likely require dewatering, depending on the time of year construction takes place. Recommendations for groundwater control during construction are presented in Section 7.4.

5.3 Basalt Bedrock

The explorations encountered strong to very strong (R4 to R5) basalt bedrock at depths ranging from 2.0 to 16.5 feet across the site. We understand that excavations for the proposed improvements are anticipated to be up to 24 feet bgs (e.g., for the primary clarifier). Therefore, rock excavation will be required. Due to its strong to very strong nature, we anticipate that the basalt bedrock will not be rippable by typical construction equipment and will require drilling and blasting. Recommendations for rock excavation are presented in Section 7.0.

6.0 Design Recommendations

6.1 Foundation Recommendations for Below-Grade Structures

Based on the 90 percent submittal plans for the project, the below-grade structures will be supported on reinforced mat foundations. Spread footing foundations may also be used for foundation support of the below-grade structures. Recommendations for these types of foundations are presented in the following sections. Table 6-1 presents a summary of the anticipated foundation conditions for the proposed below-grade structures.

Table 6-1. Anticipated Foundation Conditions for Below-Grade Structures

Structure[1]	Bottom Depth (feet bgs)	Relevant Boring(s)	Depth to Rock[5] (feet)	Anticipated Foundation Conditions	Anticipated Rock Excavation (feet)[6]
IPS[2]	1.5	P-01, P-16, P-28, P-29	11 to 12.5	Fill	0
	26.2			Bedrock	14 to 15
Primary Clarifier[3]	9.5 to 22.5	B-3, P-03, P-21, P-23, P-32	6 to 16	Bedrock	Up to 15
Aeration Basin No. 3	13 to 18	P-14, P-21	5.5 to 6	Bedrock	7 to 12
SC90	15 (Assumed)	P-18, P-30, P-31	9 to 11	Bedrock	4 to 6
SC90 RAS PS	16.5	P-20	8	Bedrock	8.5
SC90 WAS PS	16.5	B-2	Unknown	Bedrock	0
SC60 RAS/WAS PS	12.5	P-18	9	Bedrock	4
Tertiary Filters	18	P-34	15	Bedrock	3
Tertiary Building[4]	7	n/a	n/a	Fill or bedrock	n/a

Notes:
1. Bottom depths for structures based on 90 percent submittal plans and from West Yost via email on July 19, 2022.
2. The approximate southern half of the IPS will be supported on a slab-on-grade and the approximate northern half of the IPS will be founded below grade at about 26.2 feet bgs.
3. The deepest excavation is on the west side of the primary clarifier where depth to rock ranges from about 11 to 16 feet, whereas the shallowest excavation is on the east side where the depth to rock is about is about 6 feet.
4. Due to access and existing utility and access conflicts, explorations were not able to be completed near this facility.
5. Based on results of geotechnical investigation, fill depth at the site is highly variable and therefore, depth to rock may vary significantly over short distances.
6. Only to foundation bottom elevation; likely additional excavation required below for piping, leveling course, etc.

6.1.1 Subgrade Preparation

Satisfactory subgrade support for spread footings or mat foundations associated with the proposed below-grade structures can be obtained on basalt bedrock or on imported structural fill that is properly placed and compacted on the bedrock. Based on our understanding of planned foundation depths for below grade we anticipate that bedrock will likely be encountered in all below grade structure excavations. The geotechnical engineer or his representative should be contacted to observe subgrade conditions prior to placement of forms, reinforcement steel, or structural fill.

If fill materials are present below the proposed bottom-of-foundation elevation, remaining existing fill materials should be over-excavated and replaced with imported structural fill back to required elevation.

All granular pads for footings should be constructed a minimum of 6 inches wider on each side of the footing for every vertical foot of over-excavation.

Bedrock surfaces that will support spread and continuous footings should be cut as level and as smooth as practical. Placement of foundation concrete on extremely rough bedrock surfaces is not recommended, particularly for strip or continuous footings. For spread and continuous footings, we recommend a minimum of 2 inches, and not more than 12 inches, of heavily compacted, imported structural fill be placed as a leveling course where relatively smooth and level bedrock surfaces cannot be achieved during excavation. For mat foundations, we recommend a minimum 6-inch-thick layer of imported structural fill be placed as a leveling course where relatively smooth and level bedrock surfaces cannot be achieved during excavation.

6.1.2 Minimum Footing Width & Embedment

Minimum spread footing widths should be in conformance with the current OSSC. As a guideline, we recommend individual spread footings have a minimum width of 24 inches, and continuous wall footings have a minimum width of 18 inches. All footings should be founded at least 18 inches below the lowest permanent adjacent grade to develop lateral capacity and for frost protection.

6.1.3 Bearing Pressure & Settlement

Spread footings associated with below-grade structures founded as recommended in Section 6.1.1 should be proportioned for a maximum allowable bearing pressure of 5,000 pounds per square foot (psf). This bearing pressure is a net bearing pressure, applies to the total of dead and long-term live loads, and may be increased by one-third when considering seismic or wind loads.

For spread footings associated with below-grade structures founded as recommended in Section 6.1, we estimate total static settlements to be 1 inch or less, with differential settlements between adjacent columns and/or bearing walls on the order of 0.5 inch or less.

6.1.4 Design Parameters for Mat Foundations and Floor Slabs

For the imported structural fill (including leveling course) thickness of 12-inch or less overlying the bedrock surface, we recommend a maximum modulus of vertical subgrade reaction of 300 pounds per cubic inch (pci) be used for design of mat foundations and floor slabs. For structural fill thickness more than 12 inches, such as in the over-excavation and backfill to foundation level areas, we recommend the modulus of vertical subgrade reaction to be reduced to 250 pci. The subgrade modulus values represent anticipated values, which would be obtained in a standard in situ plate test with a 1-foot square plate. Use of this subgrade modulus for floor slab design should include appropriate modifications based on dimensions as necessary.

For design of the mat foundations supporting the Sludge Blend Tank and the Digested Sludge Holding Tank, a modulus of vertical subgrade reaction of 250 pci may be used, an allowable bearing capacity of 2,000 psf may be used, if applicable. These values assume that these two tanks will be supported on improved subgrade consisting of a crushed rock mat section as discussed in Section 6.3.

6.2 Foundation Recommendations for At-Grade Structures

Shallow foundation support for the at-grade structures can be derived from shallow spread footings or mat foundations. Recommendations for these types of foundations are presented in the following sections and a summary of the proposed at-grade structures is provided in Table 6-2.

Table 6-2. Anticipated Foundation Conditions for At-Grade Structures

Structure[1]	Bottom Depth (feet bgs)	Relevant Boring(s)	Depth to Rock (feet)	Anticipated Foundation Conditions	Anticipated Rock Excavation (feet)[4]
IPS[2]	1.5	P-01, P-16, P-28, P-29	11 to 12.5	Fill	0
	26.2			Bedrock	14 to 15
MEB Building[3]	1.5	B-5, P-12, P-24	3 to 8.5	Fill	0
Sludge Blend Tank	1.5	P-36	10.8	Fill	0
Digested Sludge Holding Tank	1.5	P-36	10.8	Fill	0
Building A (O&M and Controls)	1.5 (e.g., at-grade)	B-4, P-06, P-08	3.5 to 7.5	Fill	0
Building A (Headworks & Dewatering)	1.5 (e.g., at-grade)	P-04, P-05	3.5 to 7.5	Fill	0

Notes:
1. Bottom depths for structures based on 90 percent submittal plans provided by West Yost.
2. The approximate southern half of the IPS will be supported on a slab-on-grade and the approximate northern half of the IPS will be founded below grade at about 26.2 feet bgs.
3. The MEB building will be an at-grade structure and built on approximately 5 feet of new fill.
4. Only to foundation bottom elevation; likely additional excavation required below for piping, leveling course, etc.

6.2.1 Subgrade Preparation

Satisfactory subgrade support for spread footings or mat and slab-on-grade foundations associated with the proposed at-grade structures can be obtained by over-excavating a minimum of 3 feet of the undocumented fill materials and replacing it with properly placed and compacted structural fill. For the on-grade portion of the IPS and MEB Building, complete over-excavation of the undocumented fill and replacement with compacted structural fill are recommended. All granular pads for footings should be constructed a minimum of 6 inches wider on each side of the footing for every vertical foot of over-excavation. The geotechnical engineer or his representative should be contacted to observe subgrade conditions prior to placement of forms, reinforcement steel, or structural fill.

For any at-grade structure excavation that reaches bedrock, see Section 6.1.1 for subgrade preparation for bedrock surfaces.

6.2.2 Minimum Footing Width & Embedment

Minimum spread footing widths should be in conformance with the current OSSC. As a guideline, we recommend individual spread footings have a minimum width of 24 inches, and continuous wall footings have a minimum width of 18 inches. All footings should be founded at least 18 inches below the lowest permanent adjacent grade to develop lateral capacity and for frost protection.

6.2.3 Bearing Pressure & Settlement

Spread footings associated with at-grade structures founded as recommended in Section 6.2 should be proportioned for a maximum allowable bearing pressure of 2,000 pounds per square foot (psf). This bearing pressure is a net bearing pressure, applies to the total of dead and long-term live loads, and may be increased by one-third when considering seismic or wind loads.

For spread footings associated with at-grade structures founded as recommended in Section 6.2.1, we estimate total static settlements to be 1 inch or less, with differential settlements between adjacent columns and/or bearing walls on the order of 0.5 inch or less.

6.2.4 Design Parameters for Mat Foundations and Floor Slabs

For the recommended minimum 36-inch-thick layer of imported structural fill (including leveling course) overlying the undocumented fill materials, we recommend a maximum modulus of vertical subgrade reaction of 175 pounds per cubic inch (pci) be used for design of mat foundations and floor slabs. The subgrade modulus values represent anticipated values, which would be obtained in a standard in situ plate test with a 1-foot square plate. Use of this subgrade modulus for floor slab design should include appropriate modifications based on dimensions as necessary.

6.3 Foundation Recommendations for Sludge Blend Tank and Digested Sludge Holding Tank

We recommend the upper 5 feet of undocumented fill materials be removed (i.e., over-excavation of 3.5 feet) to construct a crushed rock mat section to support the Sludge Blend Tank and Digested Sludge Holding Tank. The crushed rock mat section is shown in Figure 8. Subgrade areas should be cleanly cut to firm undisturbed soil. Additional over-excavation may be required locally, especially if organic materials, construction debris, or other unsuitable materials are encountered.

Once the upper 5 feet of undocumented fill materials have been removed, the exposed subgrade surface should be rolled with a self-propelled, smooth-drum compaction equipment to recompact the subgrade to at least 92 percent of ASTM D1557. The over-excavation and subgrade compaction should be observed by a representative of the geotechnical engineer.

After the over-excavation and subgrade is approved, a strong geotextile, such as Mirafi RS580i that provides both separation/filtration and reinforcement, should be installed directly on the prepared subgrade. The overlap of the geotextile should be at least 2 feet.

After the placement of the geotextile, construction of the crushed rock mat section should follow immediately to protect the prepared subgrade. The reinforcement geotextile should consist of two layers of Mirafi RS580i (or its equivalent). The overlap of the geogrid should be at least 2 feet. The first layer of geogrid should be placed directly on the prepared subgrade, and the second layer should be at 3 feet above the first layer.

Fill materials used in the crushed rock mat section should be clean, 1½-inch minus Dense Graded Aggregates structural fill (see Section 7.6.2 for additional recommendations) and should be compacted to 92 percent of ASTM D1557. The 1½-inch minus structural fill should be placed in maximum lifts of 12 inches of loose material and should be placed such that construction equipment does not operate directly on the geotextile and rock spread such that the geotextile is not damaged or pulled apart at joints. Each lift of subgrade stabilization material should be tested by an experienced geotechnical engineering representative prior to placement of subsequent lifts.

6.4 Retaining Walls

There are six retaining walls, Wall 1 through Wall 6, proposed as part of the WRF improvements. The retaining walls will be cast-in-place, reinforced concrete cantilevered walls ranging in height from 2.5 to 6.75 feet and with footing widths ranging from 3 feet to 6 feet. The retaining walls will retain backfill heights ranging from 2 feet to 6.25 feet. We understand the retaining walls are being designed by West Yost.

The following sections and information in this report should be referenced, regarding to the design and construction of the retaining walls:

- Lateral earth pressure recommendations provided in Table 6-3;
- Retaining wall footing design and subgrade preparation should be in general accordance with Sections 6.2.1, 6.2.2, and 6.2.3 of this report;
- Lateral/sliding resistance recommendations are provided in Section 6.6; and
- Retaining wall backfill recommendations are provided in Section 7.6.3.

6.5 Uplift & Flotation Considerations

6.5.1 Below Grade Structures

Below-grade, water-tight structures should be designed to resist uplift forces during periods of high groundwater. Forces resisting uplift include self-weight of the structure and one of following two options for backfill soils. The selection depends on the geometry of the foundation behind the embedded walls:

1. When the foundation wall includes a perimeter lip (or heel) extending beyond the back face of the foundation wall, the self-weight of a soil wedge can be included. The wedge is defined by the area from the back face of the foundation wall to a plane projected upwards from the heel of the footing at an angle of 20 degrees outward from vertical. An average soil unit weight of 120 pcf

above the design groundwater level is recommended for this evaluation. A buoyant soil unit weight of 70 pcf should be used below the design groundwater level.

2. When the foundation wall *does not* include a heel, shear resistance should be evaluated using a friction coefficient of 0.4 between the structure wall and backfill in conjunction with the at-rest lateral earth pressure distribution provided in Figure 4.

A schematic showing these buoyancy resistance options is provided in Figure 5. For the evaluation of buoyancy, a design groundwater level at the ground surface is recommended. This is due, in part, to the potential for water to collect in the wall backfill and subgrade. Although water will likely dissipate into the formation, the dissipation rate may be slower than the collection rate, leading to temporary hydrostatic and uplift pressures below structure foundations.

However, this uplift resistance by either frictional or weight approach may not be sufficient due to the large footprints of some of the structures (e.g., the SC90, Aeration Basin No. 3, and Primary Clarifier structures), or structurally unfavorable for the base slab design. In this case, an underdrain system and/or pressure relief valves may need to be considered. If an underdrain system is to be considered during design, we recommend that the system consist of an 18-inch-thick layer of drain rock overlain by 6 inches of leveling course below the foundations and slabs, with 4-inch diameter perforated pipes located at the mid-height of the drainage layer. The pipes should be connected to a manhole with a pump system. The pump system can be turned on prior to maintenance for hydrostatic pressure relief and dewatering. The underdrain system can also be used as leak detection system under structures. A typical underdrain system is shown in Figure 6. More details about the underdrain system should be provided in the project plans and specifications if an underdrain system is to be utilized.

6.5.2 Pipeline Structures

Since the ground water level (modeled at the ground surface) is above the proposed pipeline structures, a check against buoyancy of the empty pipe was performed. We calculated a Factor of Safety (FOS) against flotation based on the most conservative buried pipe structure case (the 24-inch diameter RS IPS to Headworks HDPE pipeline with 3 feet of pipe cover). Our calculations showed a FOS greater than 3.5 for this buried pipe case. Therefore, we conclude that the potential flotation risk of buried pipeline structures is low.

Although the FOS against floatation is acceptable for the above, worst-case scenario, there are typically minimum depth of cover requirements to protect pipelines from traffic and structural surcharge loading. Therefore, construction live load and traffic load during the project life should be considered in the design.

6.6 Lateral Earth Pressures – Embedded Walls & Retaining Walls

Backfill material placed behind the below-grade structures, vaults, ancillary structures, as well as the proposed retaining walls should consist of free-draining crushed aggregate conforming to Section 00510.12 in the most recent OSSC. We recommend using a high groundwater level at the site ground surface in the calculation of lateral earth pressures for embedded walls. Table 6-3 summarizes our recommended lateral earth pressure values, expressed as the equivalent fluid pressures.

Table 6-3. Recommended Lateral Earth Pressures

Design Condition	Groundwater Condition	Static At-rest Pressure (psf)	Static Surcharge Pressure (psf)	Additional Seismic Pressure (psf)	Hydrostatic Pressure (psf)
At-Rest Earth Pressure	Above Groundwater	$50(H-H_W)$	0.4q	17H	--
	Below Groundwater	$50(H-H_W) + 28H_W$	0.4q	17H	$62H_W$
Active Earth Pressure	Above Groundwater	$29(H-H_W)$	0.22q	10H	--
	Below Groundwater	$29(H-H_W)+16H_W$	0.22q	10H	$62H_W$

General Notes:
1. H = total height of buried wall.
2. H_W = submerged portion of buried wall

Our recommended lateral earth pressures assume imported, free-draining crushed aggregate and finished backfill slopes flatter than 4H:1V (horizontal:vertical). The equivalent fluid earth pressures and seismic earth pressures increase with depth in a hydrostatic, triangular pressure distribution with the resultant force acting at approximately 0.3H above the base of the wall (where H is the total height of the wall). The pressure distribution of the surcharge loads is a constant value of lateral pressure resulting from the vertical, surface surcharge loads (q) with the resultant lateral surcharge force acting approximately at a height above the base of the wall equal to one-half the total wall height. Walls that extend below the anticipated high/perched groundwater level of 2.5 feet bgs should also include the hydrostatic groundwater loading. The distribution and resultant of the backfill, groundwater, and seismic earth pressure are shown on Figure 4.

6.7 Lateral Resistance – At-Grade and Below-Grade Structures

Lateral resistances for at-grade and below-grade structures can be provided by frictional resistance between the base of the foundation and the crushed rock/structural fill material, and through soil passive resistance around the embedded portion of the structure for below-grade structures. For base frictional resistance, an allowable friction factor of 0.60 for cast-in-place concrete foundations on the crushed rock/structural fill material may be used, and an allowable friction factor of 0.40 for pre-cast concrete foundations on the crushed rock/structural fill material may be used.

The design value for passive pressure should not exceed the value of 150D (in units of psf, where D is the depth of the embedment), due to the large amounts of movement necessary to mobilize full passive resistance. This value incorporates a factor of safety (FOS) of 3 from the ultimate value. Unless in paved areas, the upper 12 inches should not be used in calculating passive resistance because construction and post-construction activities often disturb this region.

6.8 Pipeline Structures

6.8.1 Pipeline Subgrade Support

The subgrade along the pipelines is anticipated to consist of basalt or fill materials (i.e., soft clayey soil, or very loose silty sand). Basalt will support the pipeline without any modifications. For areas where the trench subgrade consists of soft subgrade conditions, we recommend subgrade stabilization in general accordance with Section 7.6.6. The new pipeline construction will not result in a net increase in pressure at the base of the pipeline, and therefore pipe settlement under static conditions is expected to be negligible.

6.8.2 Pipe Zone Geotechnical Design Parameters

Flexible pipes derive their load carrying capacity from their interaction with the pipe zone backfill as the pipe deflects under load and pushes laterally against the soil. Load carrying capacity depends on the depth of the pipe, the surrounding soil conditions, the type and density of the backfill, and the thickness of compacted pipe zone backfill between the pipe and the native soil/rock in the trench wall. Based on the anticipated subsurface soil types and relative densities, we have developed the following geotechnical design parameters to be used for pipeline design.

Table 6-4. Pipeline Design Parameters

Property	Undocumented Fill Soils	Basalt Bedrock	Granular Backfill	CLSM
Moist Unit Weight, γ_m (pcf)	115	165	135	125
Saturated Unit Weight, γ_{sat} (pcf)	120	165	140	125
Friction Angle, ϕ (degrees)	30	45	38	34
Modulus of Soil Reaction, E' (psi)	700	>10,000	2400	3,000

The design parameters presented in Table 6-4 are appropriate for use in the Iowa Deflection formula (Spangler, 1941) and are consistent with American Water Works Association Manual M11 (2004).

6.8.3 Trench Width

Distance between the pipe springline and trench sidewall should be wide enough to allow for inspection, adequate backfill compaction, and field density testing. For granular backfill the minimum distance between the pipe springline and the trench sidewall should be as follows:

- Pipe diameter ≥ 36 inches: 18 inches
- Pipe diameter <36 inches and ≥ 24 inches: 12 inches
- Pipe diameter <24 inches: 9 inches

Where Controlled Low Strength Material (CLSM) is used as backfill, the trench width should extend a minimum 9 inches beyond the pipe springline for pipes with diameters greater than 36 inches. For pipes

with diameters smaller than 36 inches, the trench width should extend a minimum 6 inches beyond the pipe springline.

6.8.4 Pipeline Backfill Material

We recommend that the pipe bedding and pipe zone in the trench be constructed with imported, well-graded crushed rock, such as ¾- inch minus crushed aggregate conforming to Section 02630.10 in the most recent OSSC.

7.0 Construction Recommendations

Recommendations provided herein are for planning purposes. We assume that we will be provided an opportunity to complete our recommendations once the project details are finalized. All specifications referenced in this section referred to 2021 Oregon Standard Specifications for Construction (ODOT, 2021). We recommend completing the construction during dry season when the groundwater is at the lowest.

7.1 Site Preparation

All areas to be excavated, filled, or used as a subgrade should be stripped. Prior to stripping and excavation, utilities should be located and rerouted as necessary, and any abandoned pipes or utility conduits should be removed or stabilized in a manner that does not adversely affect performance of new facilities. Demolition of any existing buildings and foundations associated with former structures should include complete removal of all structural elements, including foundations and concrete slabs. Although we anticipate that a majority of the subgrade supporting the proposed improvements will consist of basalt bedrock, the following paragraphs are applicable to those areas in which subgrade conditions will consist of the existing, on-site undocumented fill materials (i.e., pavement/hardscaping areas, etc.).

Due to the moisture-sensitive nature of the existing on-site fill materials, all stripping and excavations should be performed using a smooth-edge excavator working from areas where material has yet to be removed. Stripping and excavation should remove surficial organic soil (sod and topsoil), trees/roots, asphalt pavement and base rock, and any loose/soft materials as determined by a qualified geotechnical engineering representative. Subgrade areas should be cleanly cut to firm, undisturbed soil. Should construction take place during wet weather, we recommend that a representative of the geotechnical engineer be present to observe the subgrade in order to evaluate whether additional preparation is indicated.

Placement of crushed rock should follow immediately after site grading in order to provide protection of the sensitive subgrade soil during construction activities. In temporary construction traffic areas, the placement of a 12-inch-thick granular working base is generally recommended. For heavily traveled construction traffic areas, thicker sections (i.e. 18 to 24 inches) and geotextile fabrics are recommended. Generally, four to six inches of crushed rock is sufficient in foot traffic areas.

7.2 Excavation

The site is underlain by fill, extending from the ground surface to depths ranging from 2.0 to 16.5 feet bgs. The fill is underlain by strong to very strong (R4 to R5) basalt. We anticipate that maximum excavation depths for the proposed improvements will be on the order of 20 feet bgs. Therefore, rock excavation will be required.

Rippability is the ease with which rock can be mechanically excavated, and it is influenced by numerous rock parameters, including unconfined compressive strength, degree of weathering, fracturing, abrasiveness, and spacing of discontinuities. Uniaxial compressive strength test results of the basalt bedrock ranged from 7,000 to 26,000 psi, with an average value of 19,000 psi. The results of Point Load

Index ($I_{S(50)}$) testing ranged from approximately 270 and 715 psi, with an average value of 510 psi, which correlate to uniaxial compressive strengths of approximately 5,100 to 17,150 psi. The results of strength tests, in conjunction with observed joint spacing and degree of weathering indicate the rock is not rippable by typical construction equipment. Therefore, rock excavation will likely require drilling and blasting.

The contractor should be responsible for selecting appropriate rock excavation techniques that prevent damage to existing facilities and minimizes over-break or over-cut beyond the excavation limits. Protruding rock of more than 4 inches above the specified subgrade elevation should not be allowed. Any large protrusions should be removed. In addition, the selection of excavation methods and procedures should consider the impact to the subgrade preparation.

7.3 Temporary Excavation Support

All excavations should be in accordance with applicable OSHA and state regulations. It is the contractor's responsibility to select the excavation methods, to monitor site excavations for safety, and to provide any shoring required to protect personnel and nearby, existing structures. A competent person, as defined by Oregon OSHA, is an individual that can identify existing and predictable excavation-related hazards and has the authority to take prompt corrective measures to eliminate such hazards. McMillen Jacobs' Project role does not include review or oversight of excavation safety. As summarized in Table 6-1, the base depths of the proposed below-grade structures are up to about 26 feet below existing site grades and may require excavation depths on the order of up to 30 feet.

Due to the depth of the proposed structures, depth to groundwater, and site restraints, temporary excavation support will likely be required for some excavations within the existing fill. For excavations extending into basalt bedrock, the rock can be cut at slopes as steep as vertical. For the undocumented fill materials, an OSHA soil type of "C" should be used; with a maximum allowable temporary cut slop of 1.5H:1V (horizontal:vertical) if fully dewatered.

Our opinions for the excavation support discussed above are for planning purposes only. The contractor should be responsible for the stability of temporary excavations and the actual means and methods to protect excavations and that temporary slopes comply with applicable local, state, and federal safety regulations, including the current Occupational Safety and Health Administration (OSHA) Excavation and Trench Safety Standards. Lateral earth pressures for design of the temporary excavation support within fill are provided in Figure 7.

7.4 Groundwater Control

Groundwater measurements made during explorations indicate groundwater levels between 2.5 and 8.5 feet bgs across the site. Groundwater levels during construction may be higher than these, especially during the wet seasons. Excavations for structures are anticipated to extend to approximately 20 feet below the ground surface. Therefore, the excavations will encounter groundwater.

Soil within the excavations are primarily fine-grained with isolated zones of sandy soils. These materials are not anticipated to produce significant volumes of water. However, due to the size of the work area and

shallow groundwater, it is anticipated that dewatering systems including sump-pumps or well points may be required.

7.5 Blasting Plan

Based on the conditions encountered in the borings, the contractor may select to use drilling and blasting methods for excavation. The drilling and blasting must conform to the requirements in Section 00335 of the most recent OSSC. The Contractor must submit a blasting plan prepared by a person qualified and experienced in blasting work at least 14 days before beginning of drilling and blasting work. The blasting plan must provide details of drilling and blasting pattern, vibration, flyrock, noise reduction method, blast area security measures, and traffic control.

Drilling and blasting activities generate vibrations. Blast designs must be developed to limit vibrations to levels that do not adversely influence existing nearby structures. Blast designs involve interrelated parameters including round length, blast hole size, spacing, location, explosive strength, and the delay and firing sequence. Delays are used to detonate fractions of seconds after blast initiation to make sure each charge will fire into a cavity created by an earlier charge.

If blasting is used, nearby structures should be pre-surveyed for documenting the existing conditions. Seismographs that are specifically designed to monitor construction blasting should be used during construction to monitor blast vibrations to verify that actual vibration levels are within an acceptable range at critical structures. If a blast results in unacceptable vibrations, special modifications to the blasting procedures should be made, such as using different delay patterns, reduction in size of individual blasts, shorter and/or smaller diameter blast holes, closer spacing of blast holes, reduction of explosives, or a combination thereof as necessary to improve results.

7.6 Fill Materials & Compaction Criteria

We anticipate that various fill materials will be used for the construction of this project and that their specific locations and placement criteria will be described in the construction plans and specifications. The following sections describe general fill criteria that are subject to modification under specific design recommendations and the development of construction plans and specifications.

7.6.1 On-Site Soils – General Use

The on-site fill materials are not suitable for re-use as structural fill, though they may be separated and stockpiled for use in non-structural or appropriate landscape applications.

7.6.2 Imported Structural Fill – General Use

Imported structural fill should conform with the requirements of ODOT 1½-inch or ¾-inch minus Dense Graded Aggregates as defined in Section 02630-10.

Imported structural fill should be placed in maximum lifts of 8 inches of loose material. Unless otherwise noted, structural fill should be compacted to 92 percent of ASTM D1557 (i.e., Modified Proctor). Proper moisture conditioning and the use of vibratory equipment will facilitate compaction of these materials.

Each lift of imported structural fill should be tested by a qualified testing agency prior to placement of subsequent lifts. This fill condition should extend horizontally outward beyond the exterior perimeter of the building and footings a distance equal to the height of the fill or 3 feet, whichever is greater.

7.6.3 Embedded Wall & Retaining Wall Backfill

Embedded wall and retaining wall backfill (wall backfill) should consist of should consist of free-draining crushed aggregate conforming to Section 00510.12 in the most recent OSSC and be compacted to a minimum of 90 percent of the maximum dry density, as determined by ASTM D 1557. Wall backfill placed within 3 feet of the wall should be compacted in lifts less than 6-inches thick using hand-operated tamping equipment (e.g., jumping jack or vibratory plate compactors). If flat work (e.g., sidewalks or pavements) is placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to 95 percent of the maximum dry density, as determined by ASTM D 1557.

7.6.4 Bedding and Pipe Zone Backfill

We recommend that pipe bedding consist of imported structural fill as described above, such as ¾-inch minus crushed aggregate base material. We recommended a minimum 6 inches of bedding below the invert of the pipe. If weak subgrade conditions are encountered, subgrade stabilization may be necessary, as discussed in Section 7.6.6.

Above the pipe bedding zone, an imported structural fill as described above should be used for the pipe zone which typically extends at least 12 inches above the top of the pipe, or as determined by West Yost or the pipe manufacturer.

Bedding and pipe zone materials should be compacted to 90 percent of the maximum dry density, as determined by ASTM D 1557.

7.6.5 Trench Backfill

Trench backfill above the pipe zone should consist of imported structural fill as described above, with a maximum particle size of ¾ inch, and with less than 8 percent material passing the U.S. Standard No. 200 Sieve. As a guideline, trench backfill should be placed in 12- to 18-inch lifts. The earthwork contractor may elect to use alternative lift thicknesses based on their experience with specific equipment and fill material conditions during construction in order to achieve the required compaction. Trench backfill materials should be compacted to 95 percent of the maximum dry density, as determined by ASTM D1557.

7.6.6 Subgrade Stabilization

If groundwater is present at the base of utility excavations, trench base stabilization material should be placed. Trench base stabilization material should consist of a minimum of 12 inches of well-graded granular material (with a maximum particle size of 3 inches and less than 5 percent material passing the U.S. Standard No. 4 Sieve) underlain by a layer of non-woven geotextile placed directly over the subgrade. The material should be free of organic matter and other deleterious material, placed in one lift, and compacted until well keyed. Vibratory compaction equipment is not recommended due to risk of

additional disturbance to the subgrade. A reinforcement geotextile should be used below the aggregate as described in Section 7.7.2.

7.6.7 Controlled Low-Strength Material (CLSM)

CLSM is a self-compacting, cementitious material that is typically considered when backfilling localized areas. CLSM is sometimes referred to as "controlled density fill" or CDF. Due to its flowable characteristics, CLSM typically can be placed in restricted-access excavations where placing and compacting fill is difficult. If chosen for use at this site, we recommend the CLSM conform with Section 00442 in the most recent OSSC. The geotechnical engineer's representative should observe placement of the CLSM and obtain samples for compression testing in accordance with ASTM D4832. As a guideline, for each day's placement, two compressive strength specimens from the same CLSM sample should be tested. The results of the two individual compressive strength tests should be averaged to obtain the reported 28-day compressive strength. If CLSM is considered for use on this site, please contact the geotechnical engineer for site-specific and application-specific recommendations.

7.6.8 Pavement Materials – Asphalt & Base Course

Asphalt pavement and base course materials should conform to the requirements set forth in the most recent Oregon SSC guidelines. Base course material should consist of a well-graded, 1½-inch or ¾-inch-minus, crushed rock, having less than 5 percent material passing the No. 200 sieve. Base course material should be moisture conditioned to within 2 percent of optimum moisture content and compacted by mechanical means to a minimum of 95 percent of the material's maximum dry density, as determined in accordance with ASTM D 1557. Base coarse materials should be placed in layers that, when compacted, do not exceed about 8 inches. The asphalt pavement should be compacted to at least 92 percent of the material's theoretical maximum density as determined in accordance ASTM D 2041 (Rice Specific Gravity).

7.7 Geotextiles

7.7.1 Separation Geotextiles

In general, the widespread use of separation geotextiles is not anticipated for the project. However, they may be required in localized areas of trench seepage or for protection of subgrade, or in other areas identified during construction. They are not required for typical trench construction. If used, separation geotextiles should consist of a "needle-punched", non-woven separation fabric meeting the requirements for nonwoven drainage geotextiles, as shown in Table 02320-4 in OSSC Section 02320.

7.7.2 Reinforcement Geotextiles

A reinforcement geotextile system should be installed beneath subgrade stabilization backfill within the pipeline trenches. We recommend a single-layer system consisting of a strong geotextile, such as Mirafi RS380i, that provides both separation/filtration and reinforcement. The reinforcement/separation geotextile should be installed on the base of the trench and extend up to the top of the subgrade stabilization zone (below bedding) at a minimum. Reinforcement geotextiles should meet the requirements for Type 2, woven riprap geotextiles, as shown in Table 02320-2 in ODOT OSSC Section 02320 (ODOT, 2021).

For construction of the crushed rock mat section to support the Sludge Blend Tank and the Digested Sludge Holding Tank, we recommend using the Mirafi RS580i geotextile, which is very similar to the Mirafi RS380i discussed above, but has a higher tensile strength and modulus.

7.8 Wet Weather Construction

For planning purposes, the wet season should be considered to extend from late September to late June. It is our experience that dry weather working conditions should prevail between early July and the middle of September.

The soils encountered within the project area are highly moisture sensitive and will degrade after being traversed by construction equipment during periods of wet weather or wet conditions. Therefore, during or after wet weather, it will likely be necessary to import granular materials for structural fill or to protect exposed subgrade materials. Delays in site earthwork activities should be anticipated during periods of heavy rainfall. If earthwork is performed during extended periods of wet weather or in wet conditions, we recommend the following:

- Cover the base of trenches within soil with trench stabilization material.
- Excavations should be protected from surface water runoff by placing sandbags or by other means to promote runoff of precipitation away from work areas and to prevent ponding of water in excavations.
- Plastic covers, sloping, ditching, sumps, dewatering, and other measures should be employed in work areas as necessary to permit timely completion of work. Bales of straw and/or geotextile silt fences should be used to control surface soil movement and erosion.
- Excavations (specifically trench excavations) should be completed in small sections and backfilled at the end of each day to reduce exposure to wet conditions.
- Excavation or the removal of unsuitable soil should be followed promptly by placement and compaction of trench or foundation stabilization fill.
- The size and type of construction equipment used may have to be limited to minimize soil disturbance.

8.0 Closure

This report has been prepared for the exclusive use of the City of Sweet Home and West Yost Associates, Inc. in connection with the Sweet Home Wastewater Treatment Plant – Final Design project. The data presented in this report is based on the subsurface conditions encountered during our site explorations. The data presented herein is intended to support the design of the proposed improvements. McMillen Jacobs Associates is not responsible for the interpretation of the data contained in this report by anyone; as such interpretations are dependent on each person's subjectivity.

The geotechnical engineering evaluations and interpretations are completed within the limitations of McMillen Jacobs Associates approved scope of work, schedule and budget. The services rendered by McMillen Jacobs Associates have been performed in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same area. The construction recommendations are considered preliminary and provided for planning purposes only. McMillen Jacobs Associates is not responsible for the use of this report in connection with anything other than the project at the location described above.

MCMILLEN JACOBS ASSOCIATES



Wolfe Lang, P.E., G.E.
Principal Geotechnical Engineer

Jeff Quinn, P.E.
Senior Project Engineer

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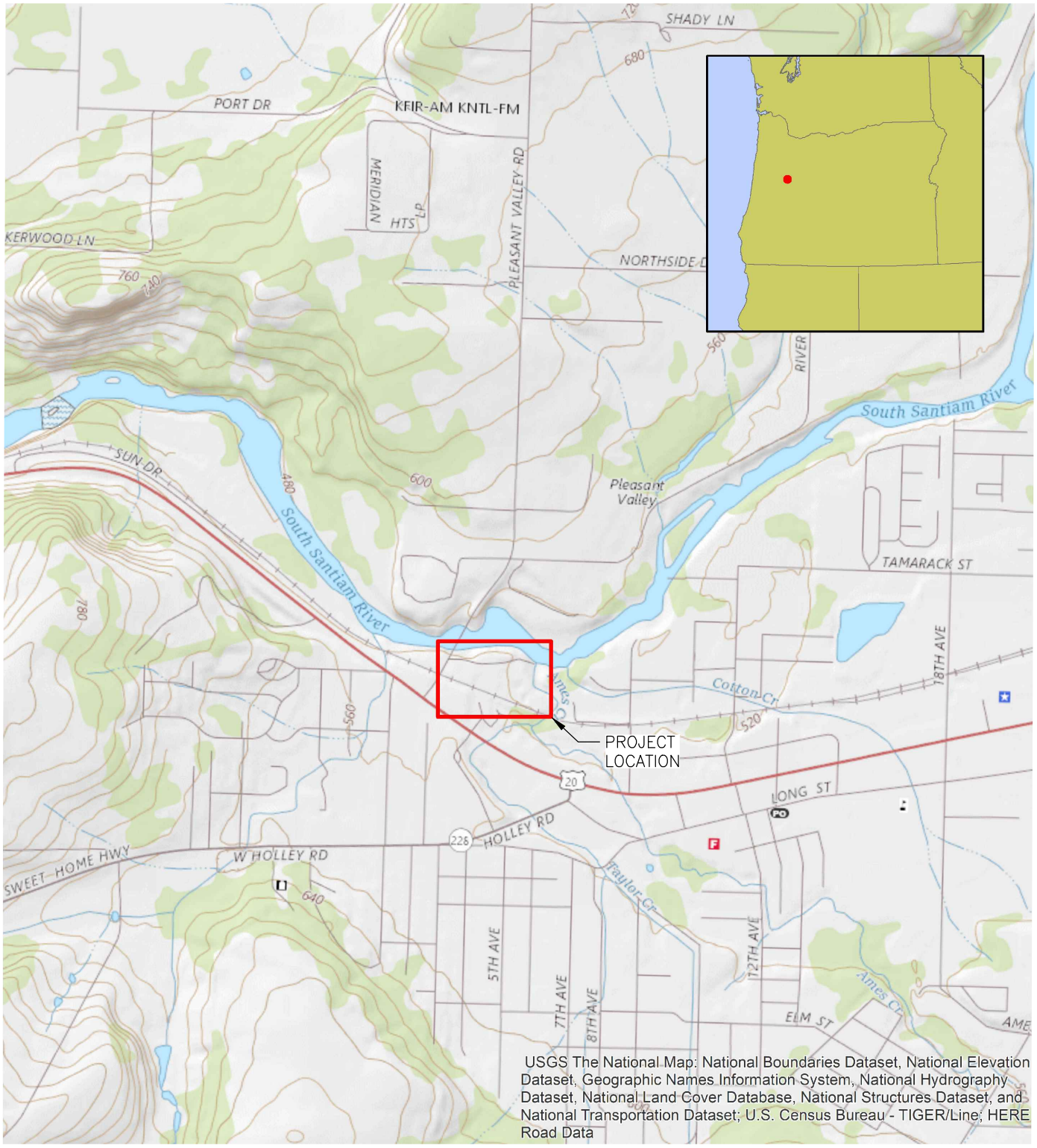
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Figures



PROJECT VICINITY MAP

SCALE: NTS

N

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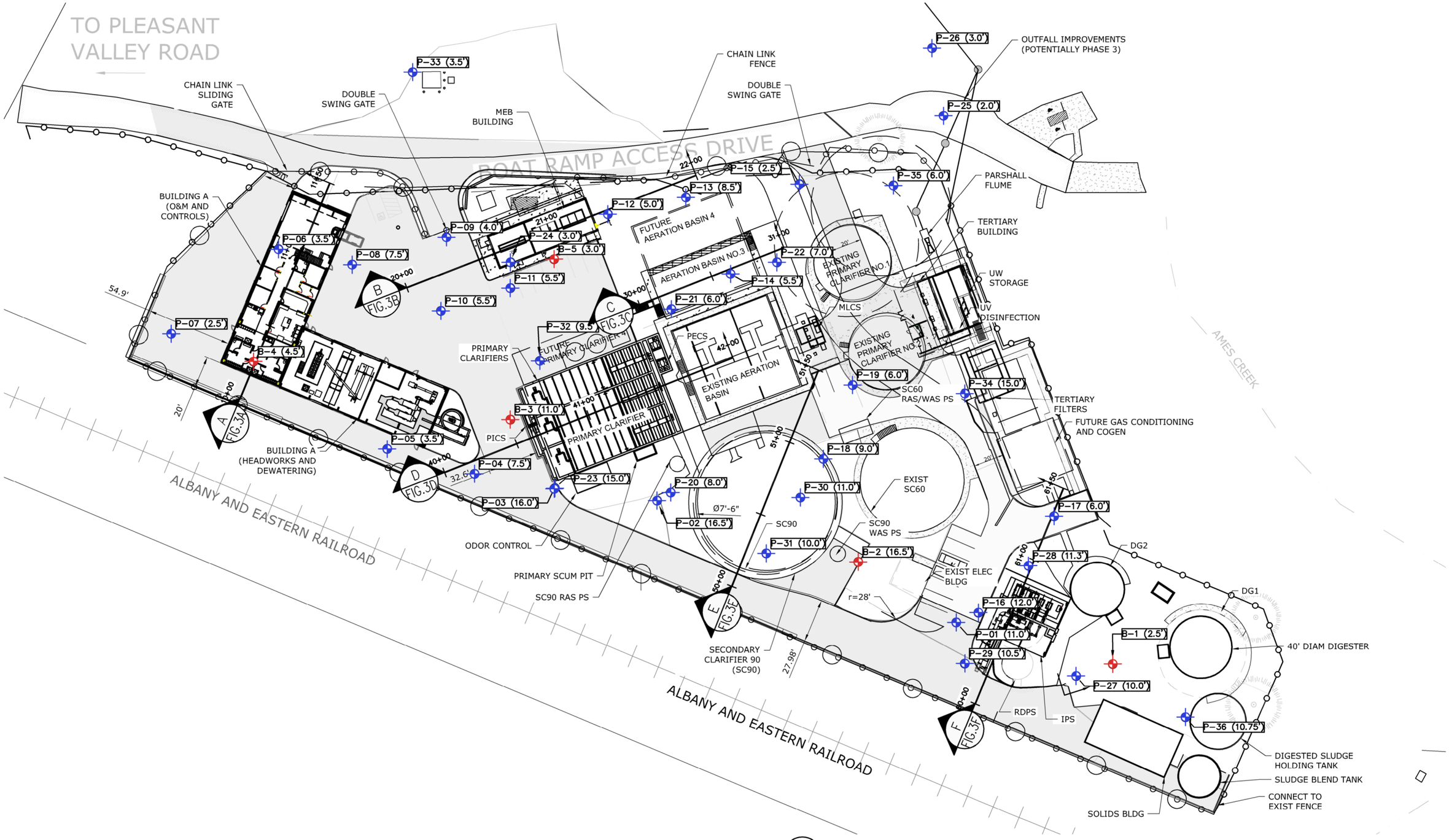
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
PROJECT VICINITY MAP

FIG.1

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LEGEND:

B–1 (XX.X') BOREHOLE LOCATION (DEPTH TO ROCK IN FT)

P–01 (XX.X') PROBE–HOLE LOCATION (DEPTH TO ROCK IN FT)

EXPLORATION PLAN

SCALE: 1"=60'

0' 60' 120'

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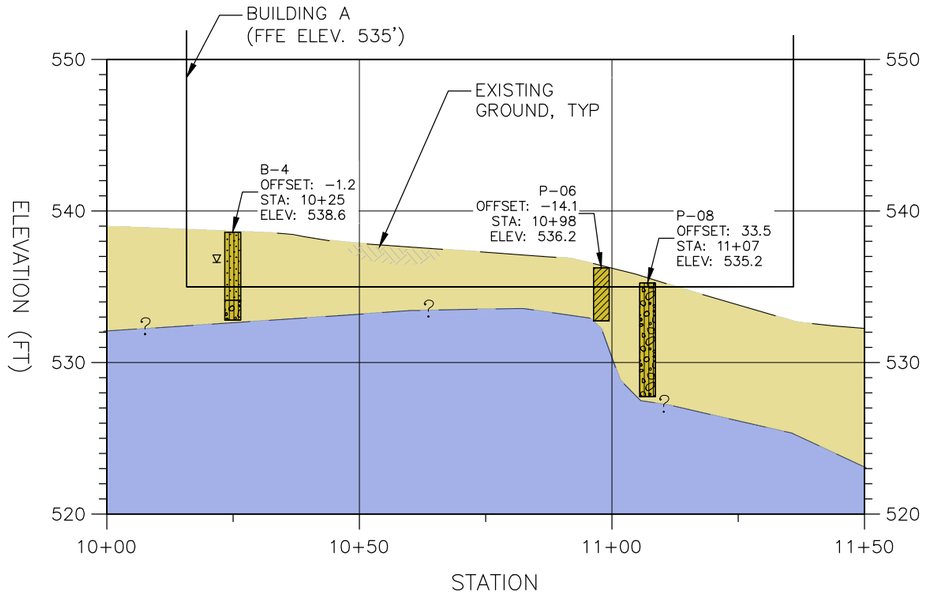
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GEOTECHNICAL ENGINEERING REPORT
EXPLORATION PLAN

FIG.2

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GEOLOGIC PROFILE STA 10+00 TO 11+50

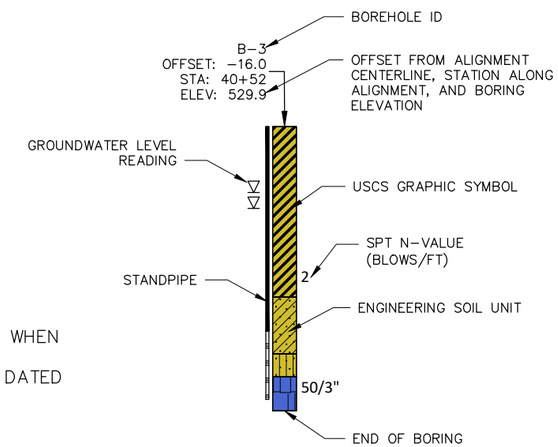
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

A
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

1. BOREHOLE LOCATIONS ARE APPROXIMATE.
2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

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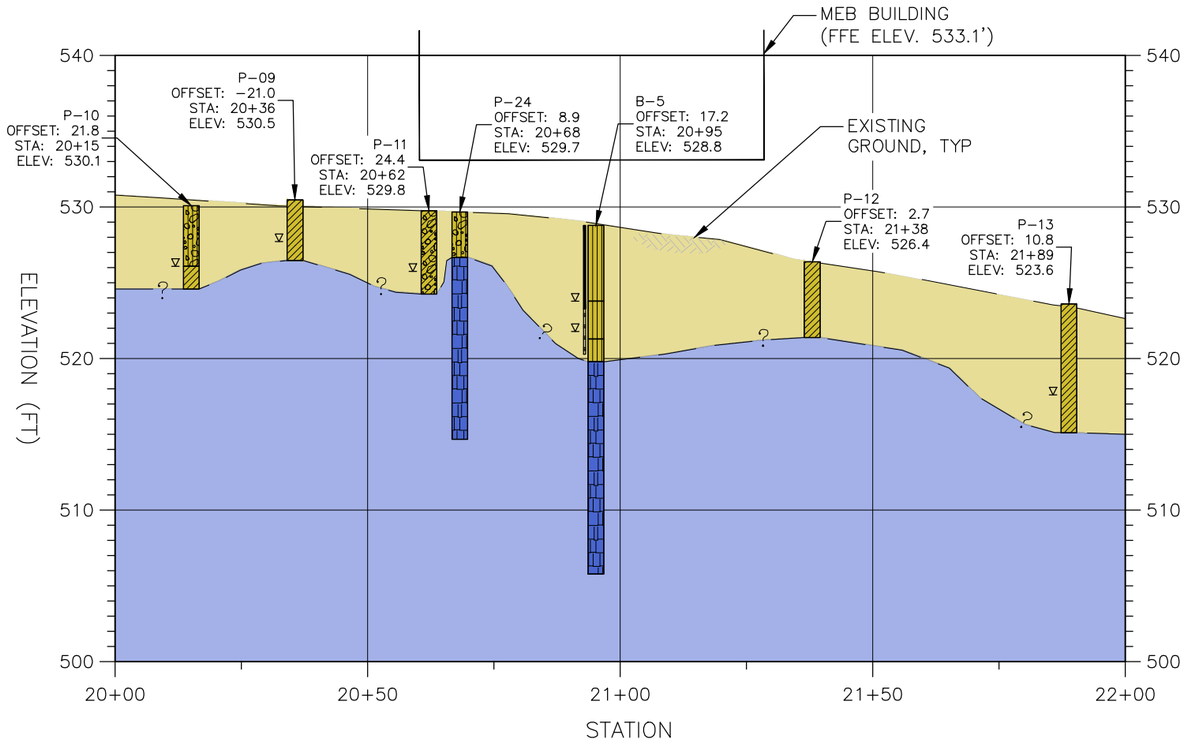
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
BUILDING A

FIG.3A

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GEOLOGIC PROFILE STA 20+00 TO 22+00

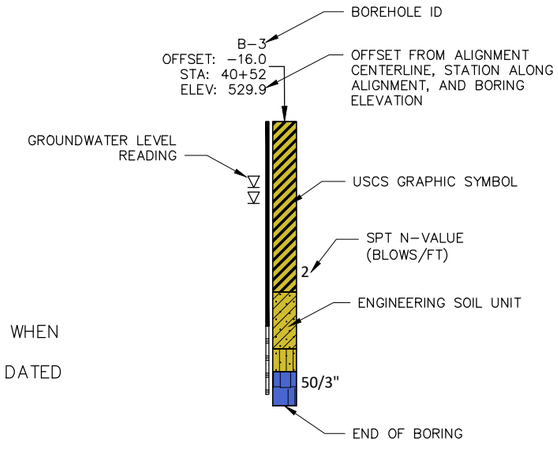
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

B
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

1. BOREHOLE LOCATIONS ARE APPROXIMATE.
2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

McMILLEN JACOBS ASSOCIATES

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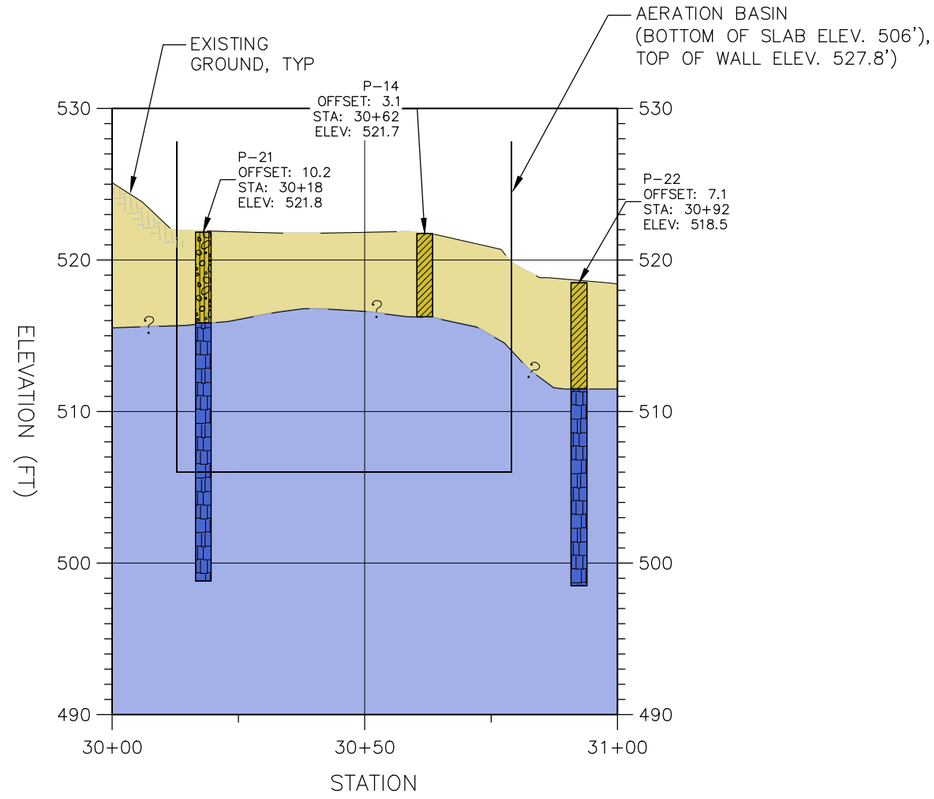
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GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
MEB BUILDING

FIG.3B

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GEOLOGIC PROFILE STA 30+00 TO 31+00

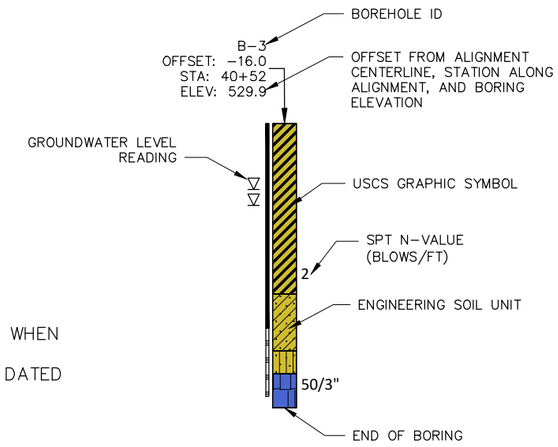
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

C
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

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2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

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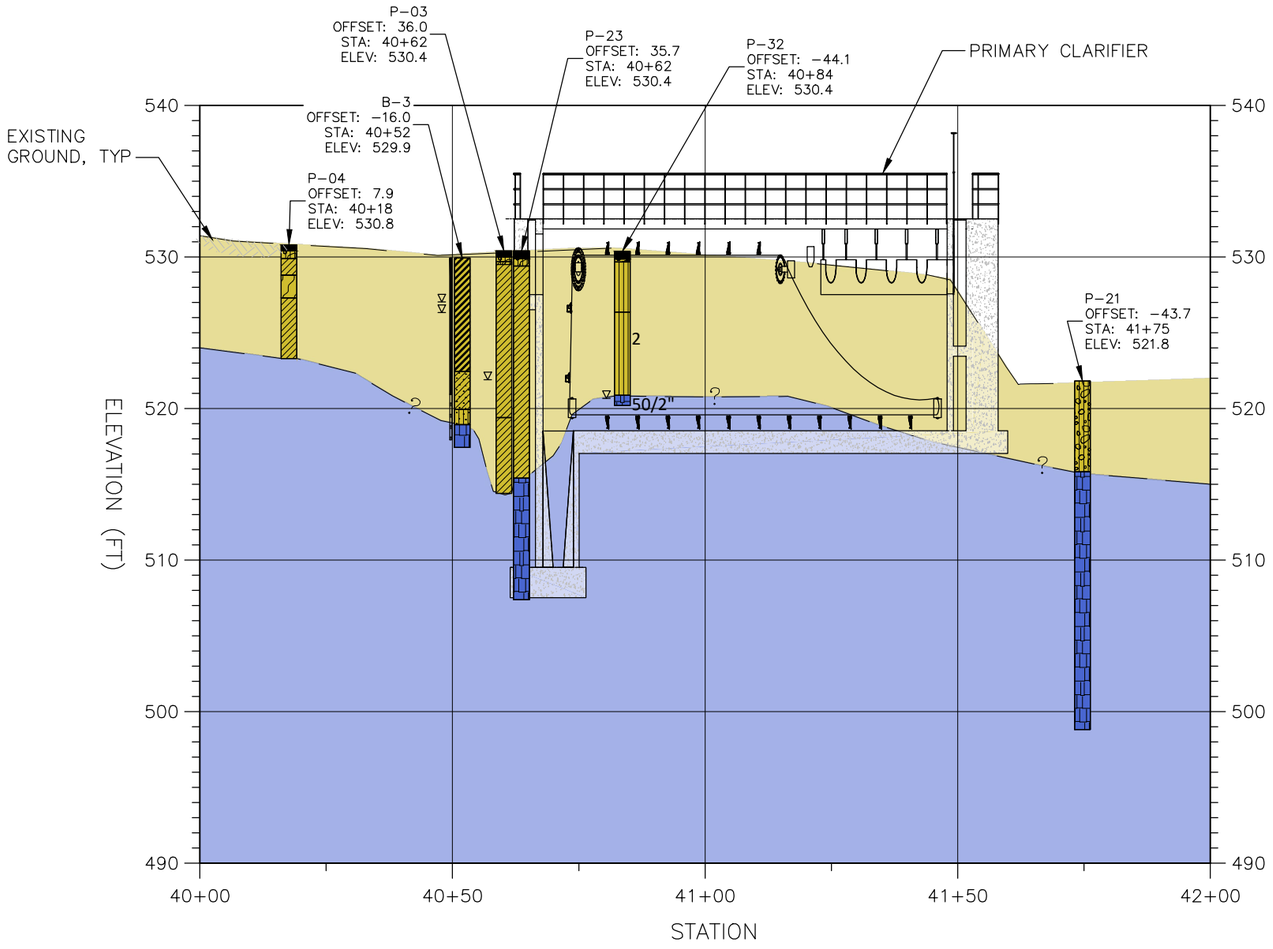
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GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
AERATION BASIN NO. 3

FIG.3C

DEC 2022

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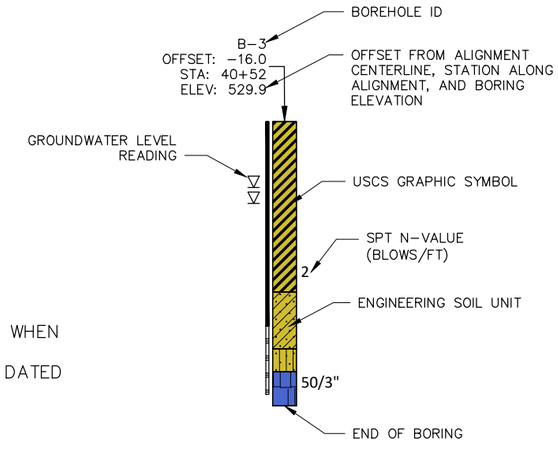
GEOLOGIC PROFILE STA 40+00 TO 42+00

SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'
0' 10' 20'

D
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

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4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

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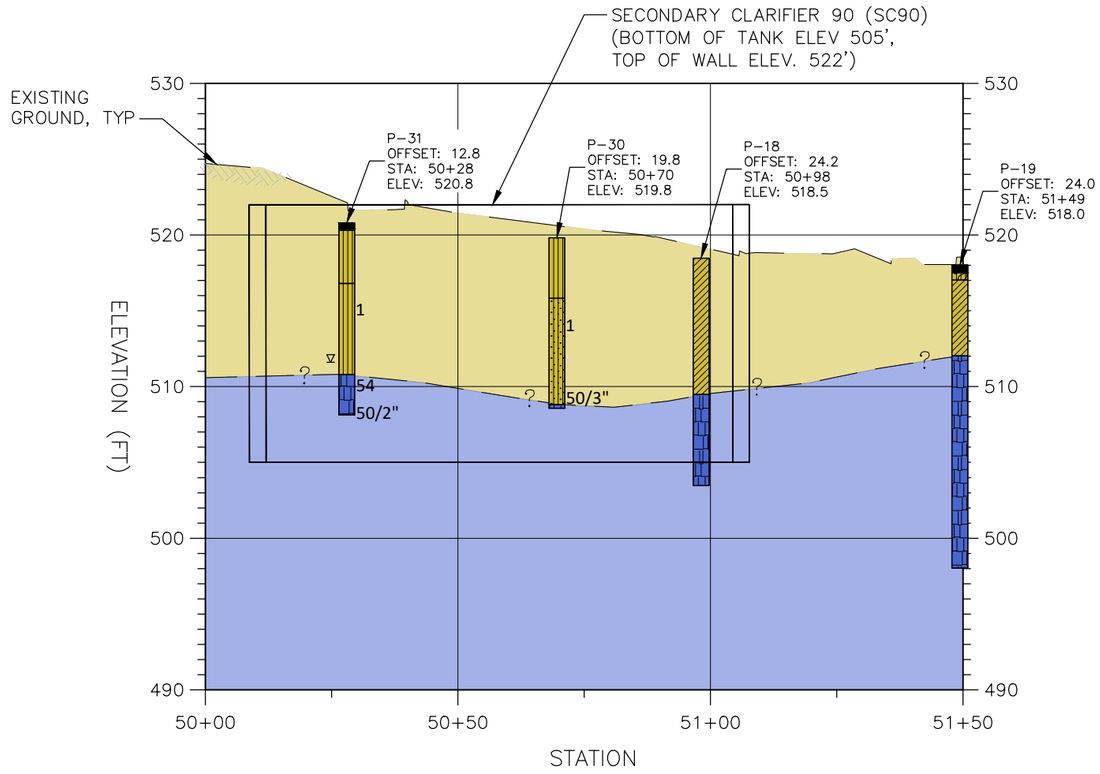
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
PRIMARY CLARIFIER

FIG.3D

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GEOLOGIC PROFILE STA 50+00 TO 51+50

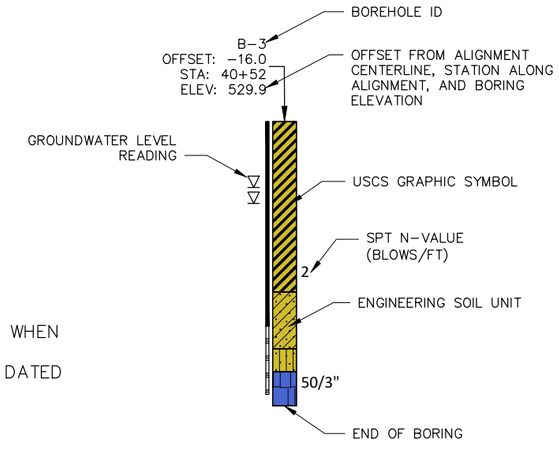
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

E
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

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4. ALIGNMENT IS BASED ON 90% DRAWINGS PROVIDED BY WEST YOST ASSOCIATES, DATED JUNE 2022.

McMILLEN JACOBS ASSOCIATES

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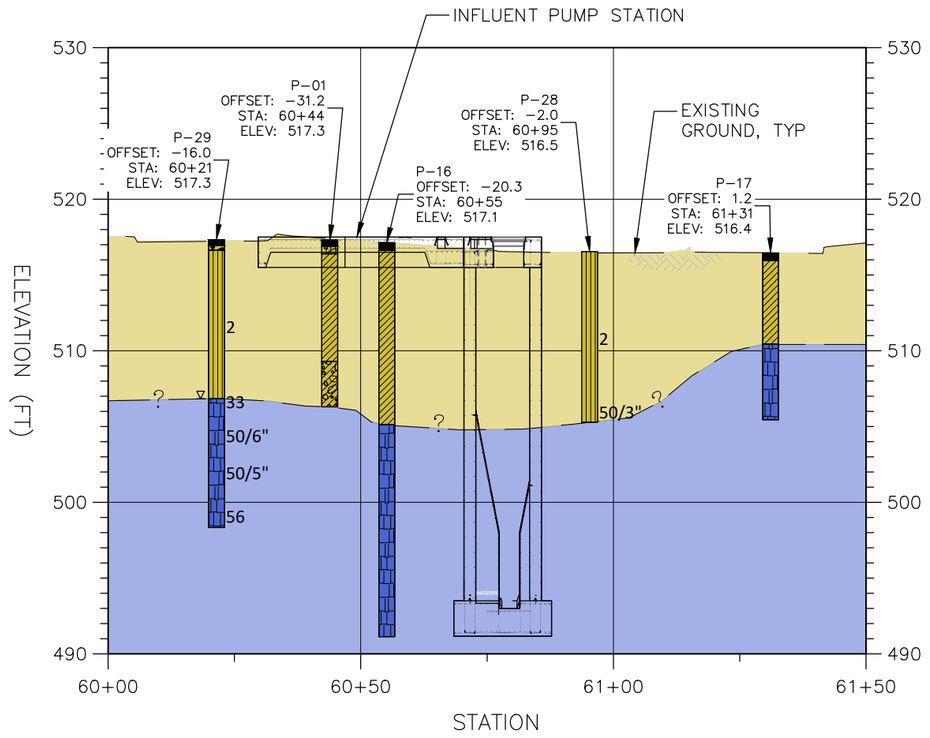
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
SECONDARY CLARIFIER 90 (SC90)

FIG.3E

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GEOLOGIC PROFILE STA 60+00 TO 61+50

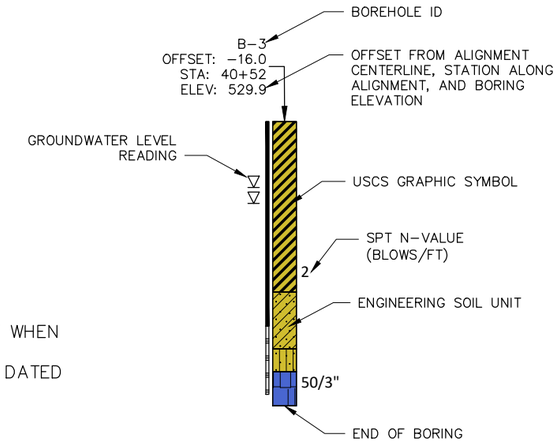
SCALE: 1"=30' HORIZ
1"=10' VERT

0' 30' 60'

0' 10' 20'

F
FIG.2

BORING/PROBE-HOLE LEGEND:



STRATIGRAPHIC LEGEND:

- WELL-GRADED GRAVEL (GW)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- SILT (ML)
- LEAN CLAY (CL)
- LOW PLASTICTIY ORGANIC CLAY (OL)
- FAT CLAY (CH)
- BASALT
- FILL
- BASALT

NOTES:

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2. BOREHOLE LOCATIONS ARE PROJECTED PERPENDICULAR TO ALIGNMENT.
3. OFFSETS ARE NEGATIVE LEFT OF ALIGNMENT AND POSITIVE RIGHT OF ALIGNMENT WHEN TRAVELING IN THE DIRECTION OF INCREASING STATION.
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McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

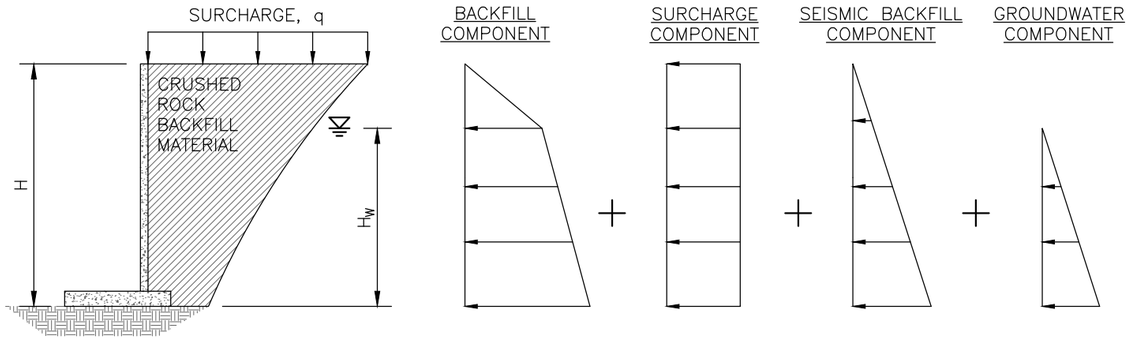
GEOTECHNICAL ENGINEERING REPORT
GEOLOGIC PROFILE
INFLUENT PUMP STATION

FIG.3F

DEC 2022

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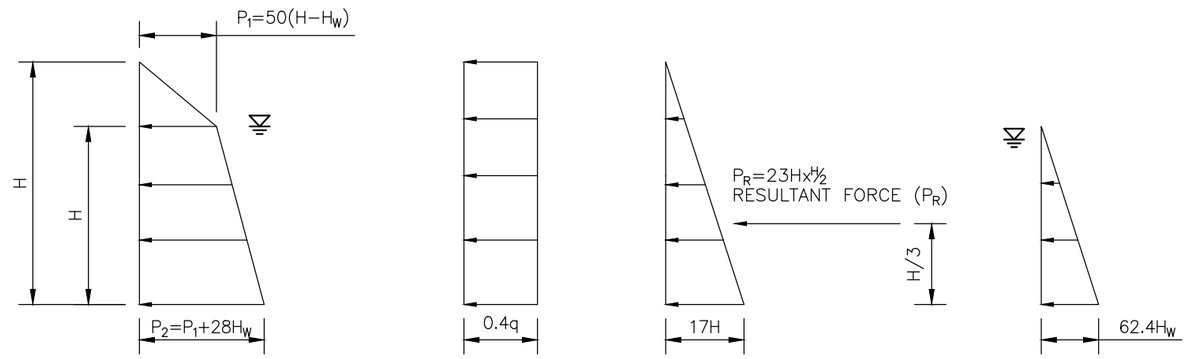
LATERAL EARTH PRESSURES ON EMBEDDED WALLS & STRUCTURES



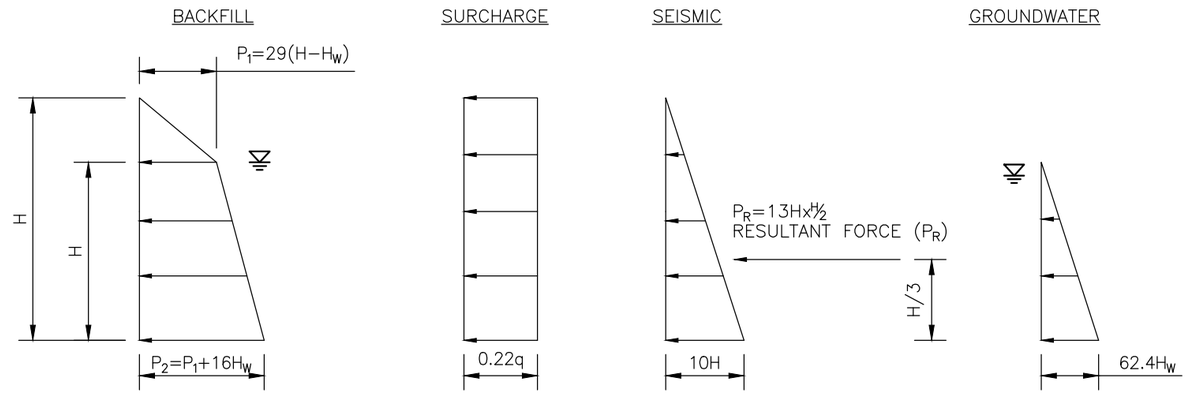
NOTES:

1. UNITS ARE POUNDS PER SQUARE FOOT (PSF).
2. BACKFILL PRESSURES BASED ON IMPORTED CRUSHED ROCK.
3. HEIGHT OF GROUNDWATER, H_W, SHOULD BE TAKEN AT GROUND SURFACE.

RESTRAINED (NON-YIELDING) EMBEDDED WALLS & STRUCTURES



NON-RESTRAINED (YIELDING) BASEMENT WALLS



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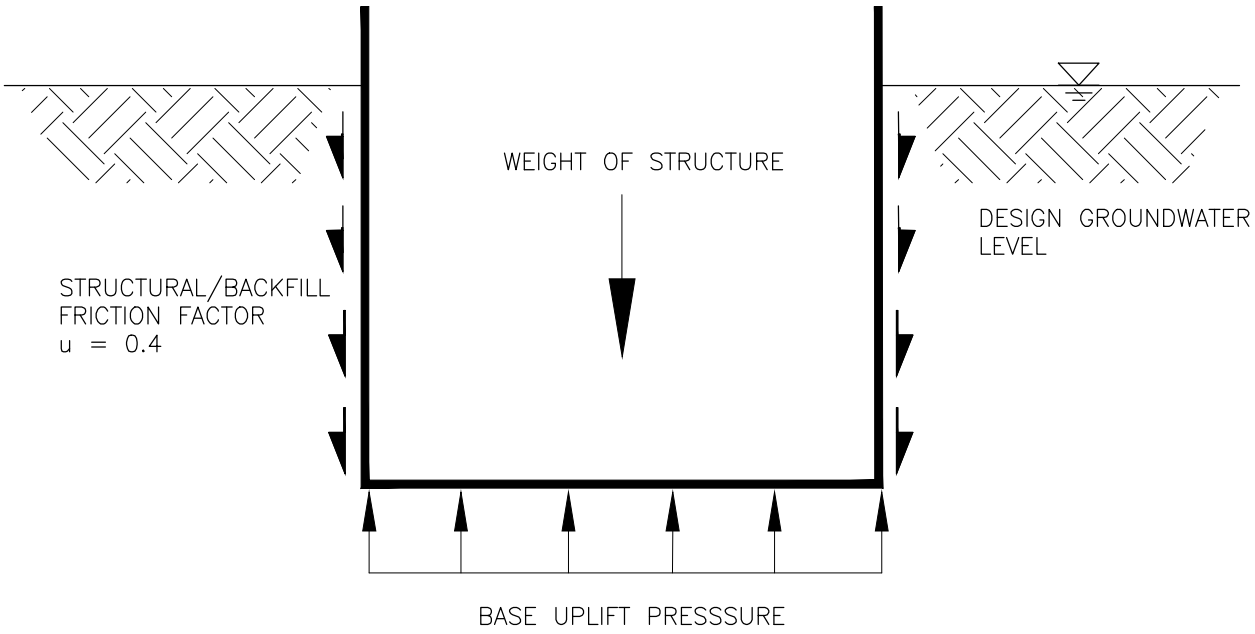
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
LATERAL EARTH PRESSURES FOR EMBEDDED WALLS

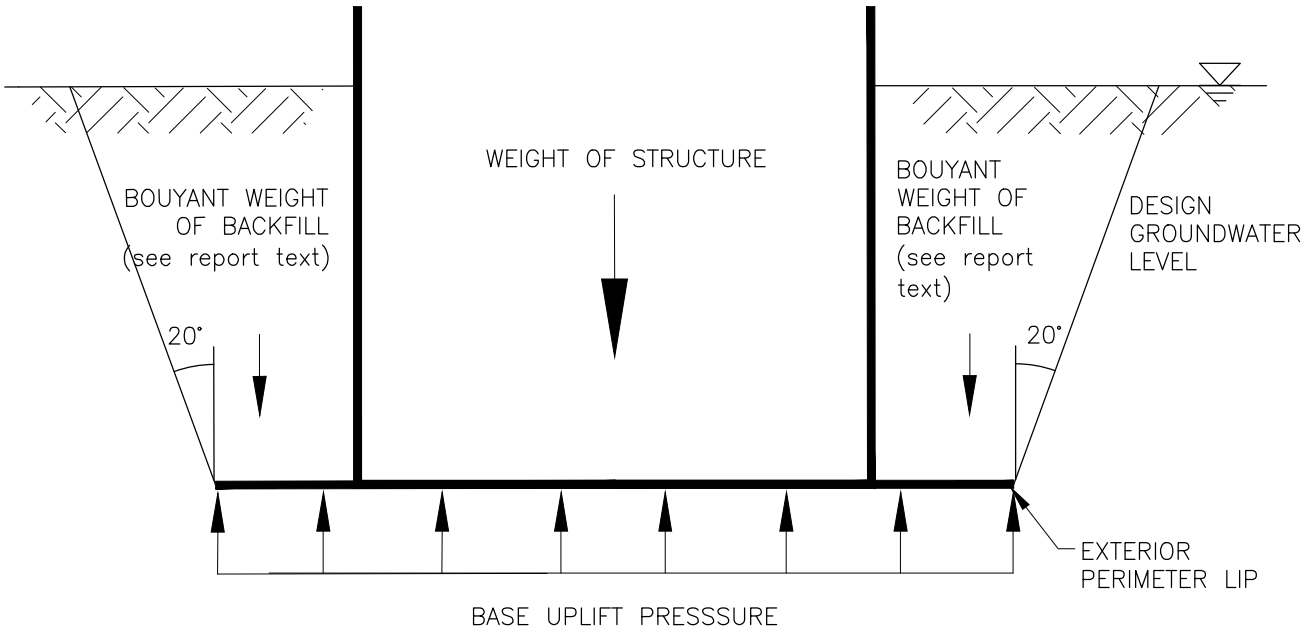
FIG.4

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STRUCTURE WITHOUT EXTERIOR PERIMETER LIP



STRUCTURE WITH EXTERIOR PERIMETER LIP

HYDROSTATIC UPLIFT PRESSURE AND RESISTANT FORCES

SCALE: NTS

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

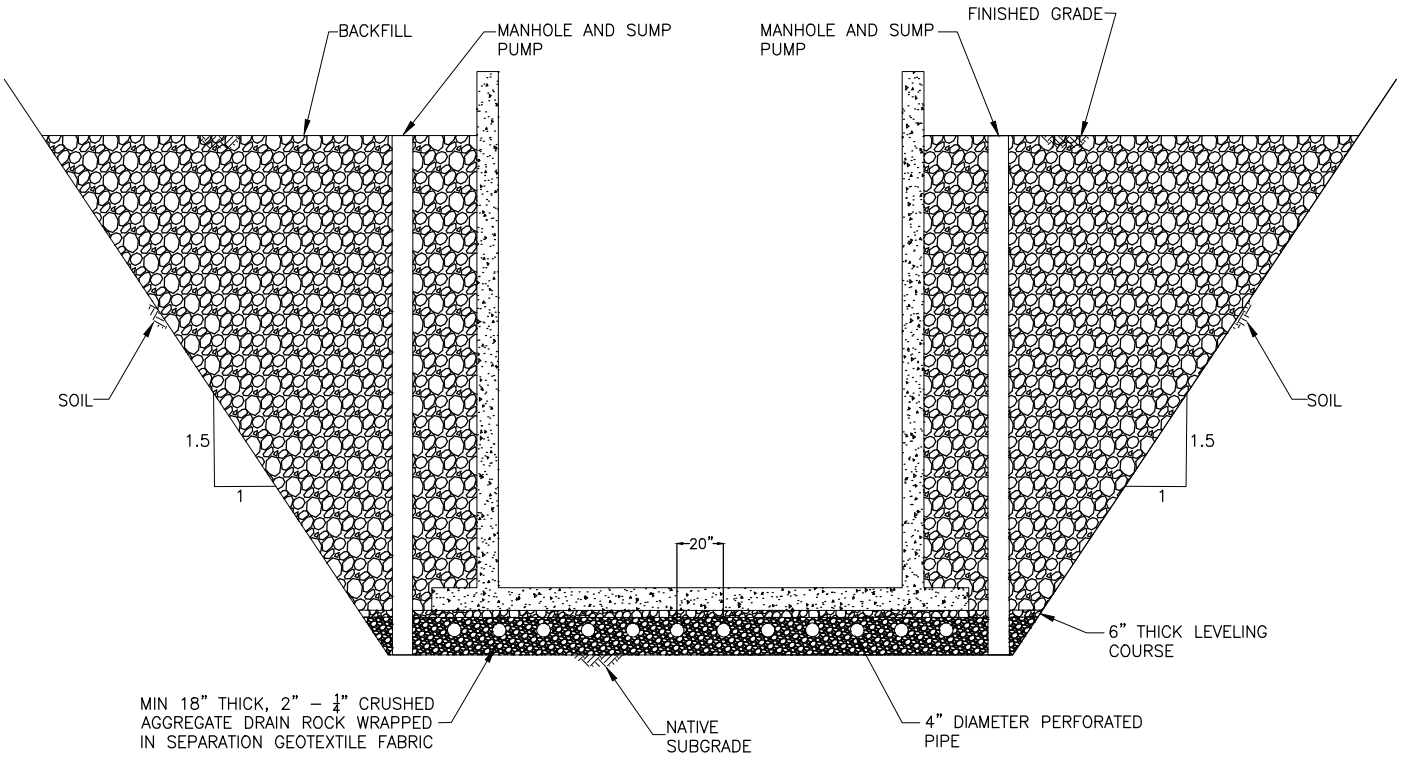
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GEOTECHNICAL ENGINEERING REPORT
LATERAL EARTH PRESSURE DIAGRAM
HYDROSTATIC UPLIFT PRESSURE AND RESISTING FORCES

FIG.5

DEC 2022

Path: C:\Users\cburke\Box\Jobs\6367.0 Sweet Home WWTP Final Design Review\900 Design Technology\970_Xrefs\Fig.5 – Hydrostatic Uplift.dwg Plot date: Jul 22, 2022, CAD User: cburke



UNDERDRAIN SYSTEM
SCALE: NTS

McMILLEN JACOBS ASSOCIATES

CITY OF SWEET HOME

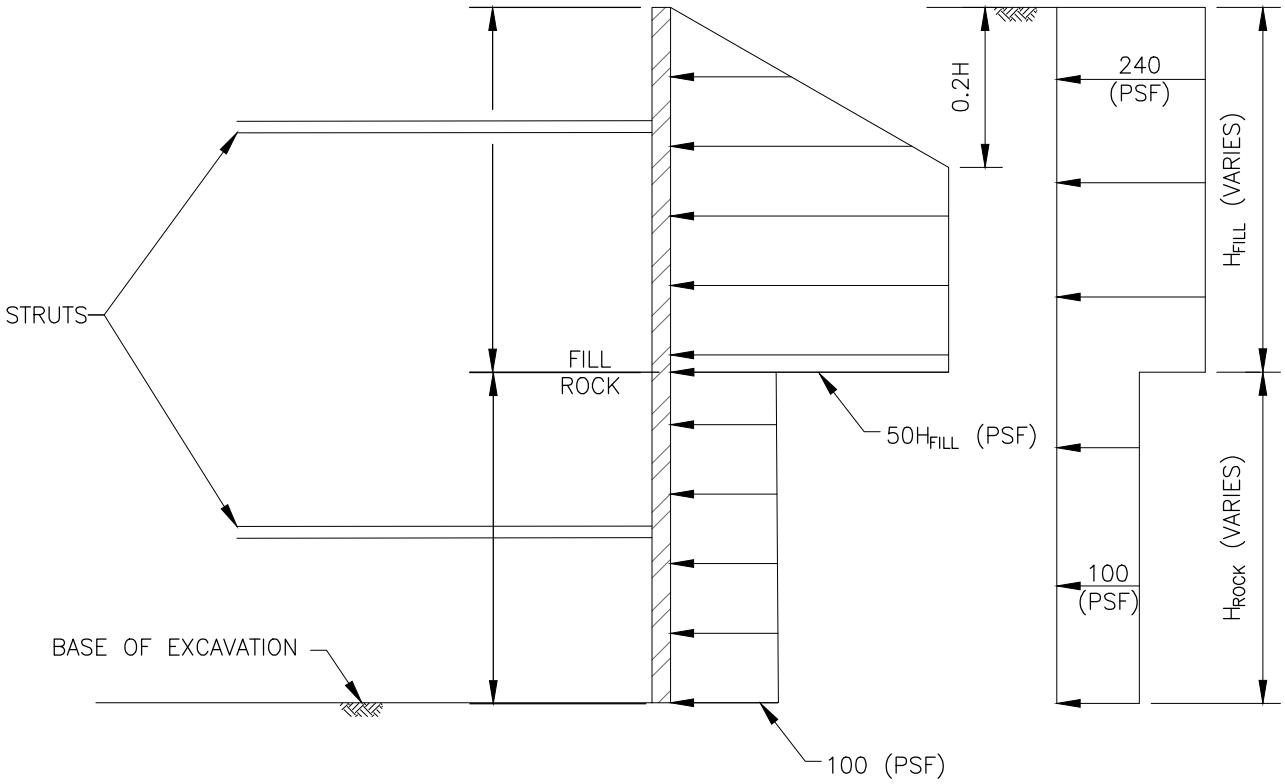
MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
CONCEPTUAL UNDERDRAIN SYSTEM

FIG.6

DEC 2022

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APPARENT LATERAL EARTH PRESSURE DIAGRAM – TEMPORARY SHORING
SCALE: NTS

NOTES:

1. EARTH PRESSURE DIAGRAM ASSUMES BRACED EXCAVATION SUPPORT.
2. SURCHARGE LOAD MAY VARY BASED ON CONTRACTOR EQUIPMENT LOADS.
3. EARTH PRESSURE DIAGRAM ASSUMES LEVEL GROUND BEHIND SHORING.
4. EARTH PRESSURE DIAGRAM DOES NOT CONSIDER GROUNDWATER – GROUNDWATER PRESSURE SHOULD BE ADDED IF GROUNDWATER IS PRESENT.

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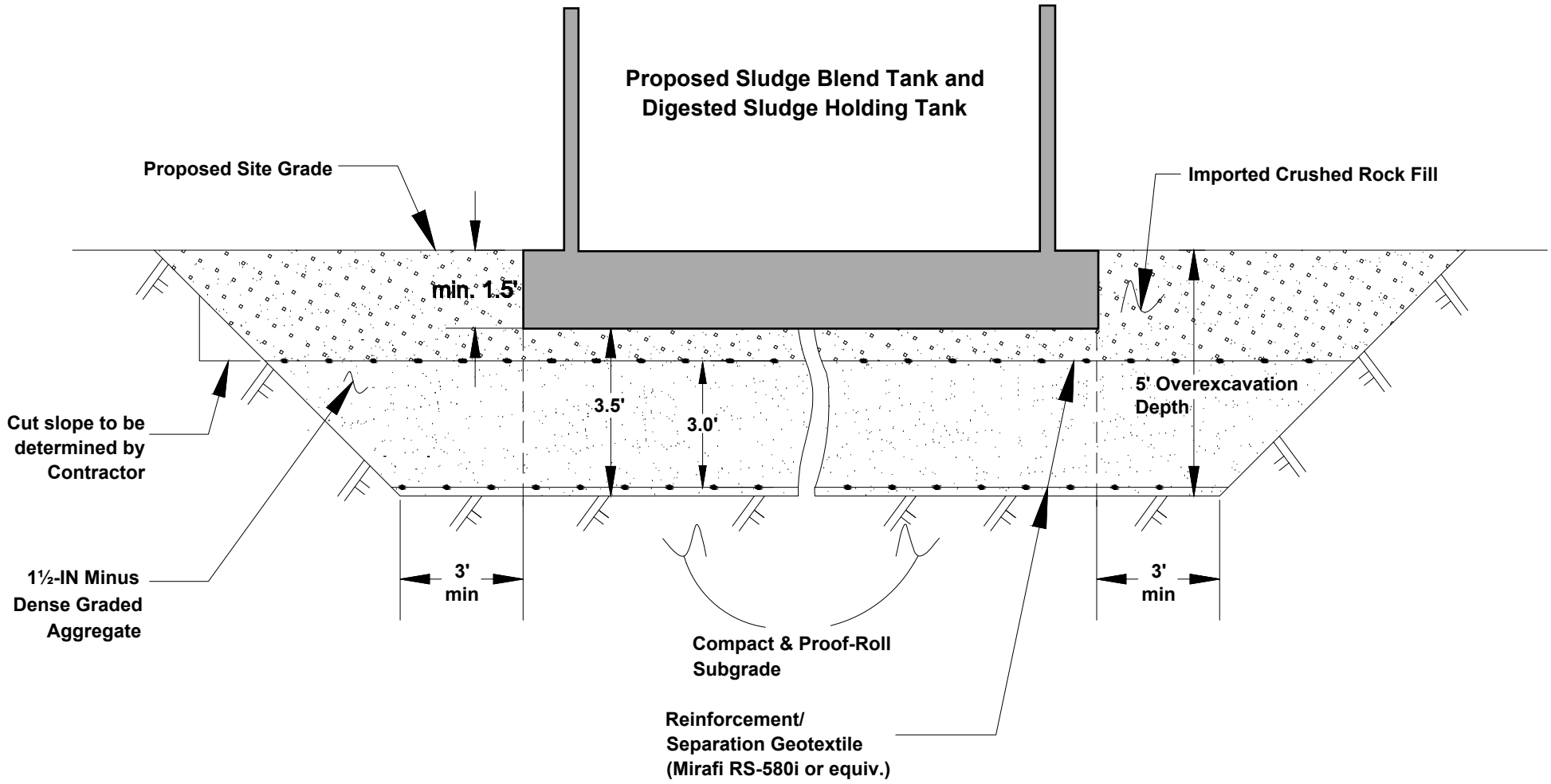
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GEOTECHNICAL ENGINEERING REPORT
LATERAL EARTH PRESSURE DIAGRAM
TEMPORARY SHORING

FIG.7

DEC 2022

Path: C:\Users\cburke\Box\Jobs\6367.0 Sweet Home WWTP Final Design Review\900 Design Technology\970_Xrefs\Fig.7 – Temporary Shoring.dwg Plot date: Jul 22, 2022, CAD User: cburke



NOTES

1. Upon reaching bottom of 5-foot overexcavation, compact exposed subgrade surface with heavy roller compactor or excavator-mounted hoe pack.
2. Subgrade stabilization material should be placed in 12-inch loose lifts.

NOT TO SCALE

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MAHLER WATER RECLAMATION FACILITY IMPROVEMENTS

GEOTECHNICAL ENGINEERING REPORT
CRUSHED ROCK MAT SECTION

FIG.8

DEC 2022

Appendix A

Boring Logs

McMILLEN JACOBS ASSOCIATES

Key to Log of Borings and Descriptive Terms for Soils
Project: 5834.0 Sweet Home WWTP Schematic Design
Sweet Home, OR

Soil Legend

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS Based on ASTM D2488 & D2487)					
MAJOR DIVISIONS			GROUP/SYMBOL		TYPICAL DESCRIPTION
COARSE-GRAINED SOILS (50% or more retained on No. 200 sieve)	GRAVELS (more than 50% retained on No. 4 sieve)	CLEAN GRAVELS (less than 5% fines)	GW		WELL-GRADED GRAVEL
			GP		POORLY GRADED GRAVEL
		GRAVELS (with 5 to 12% fines)	GW-GM		WELL-GRADED GRAVEL WITH SILT
			GW-GC		WELL-GRADED GRAVEL WITH CLAY
			GP-GM		POORLY GRADED GRAVEL WITH SILT
			GP-GC		POORLY GRADED GRAVEL WITH CLAY
		GRAVELS WITH FINES (more than 12% fines)	GM		SILTY GRAVEL
			GC		CLAYEY GRAVEL
	SANDS (less than 50% retained on No. 4 sieve)	CLEAN SANDS (less than 5% fines)	SW		WELL-GRADED SAND
			SP		POORLY GRADED SAND
		SANDS (with 5 to 12% fines)	SW-SM		WELL-GRADED SAND WITH SILT
			SW-SC		WELL-GRADED SAND WITH CLAY
			SP-SM		POORLY GRADED SAND WITH SILT
			SP-SC		POORLY GRADED SAND WITH CLAY
		SANDS WITH FINES (more than 12% fines)	SM		SILTY SAND
			SC		CLAYEY SAND
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS & CLAYS (liquid limit less than 50)	INORGANIC	ML		SILT
			CL		LEAN CLAY
		ORGANIC	OL		LOW PLASTICITY ORGANIC CLAY
	SILTS & CLAYS (liquid limit greater than 50)	INORGANIC	MH		ELASTIC SILT
			CH		FAT CLAY
		ORGANIC	OH		HIGH PLASTICITY ORGANIC CLAY
	SILT/CLAY (liquid limit between 12 and 25)	INORGANIC	CL-ML		CLAYEY SILT / SILTY CLAY
HIGHLY ORGANIC SOILS	PRIMARILY ORGANIC MATTER		PT		PEAT

Notes:

1. Dual symbols (symbols separated by a hyphen, e.g. SP-SM, slightly silty fine SAND) are used for soils between 5% and 12% fines or when liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

Moisture Content

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water, usually from below water table.

Gradation

Gradation	Description
Well-Graded	Approximately equal amounts of all grain sizes
Poorly Graded	Predominately one size (uniformly graded) or a wide range of sizes with a missing intermediate size (gap-graded)

Grain Size

Term	Grain Size	Example
Boulder	Greater than 12" (30cm)	Basketball or Larger
Cobble	3" - 12" (75mm - 30cm)	Fist to Basketball
Gravel Coarse	¾" - 3" (20mm - 75mm)	Thumb to Fist Sized
Gravel Fine	No. 4 Sieve - ¾" (5mm - 20mm)	Pea to Thumb Sized
Sand Coarse	No. 10 Sieve - No. 4 Sieve (2mm - 5mm)	Rock Salt to Pea Sized
Sand Medium	No. 40 Sieve - No. 10 Sieve (0.4mm - 2mm)	Sugar to Rock Salt
Sand Fine	No. 200 sieve - No. 40 sieve (0.08mm - 0.4mm)	Flour to Sugar
Fines	Passing No. 200 Sieve (0.08mm)	Grains Not Visible

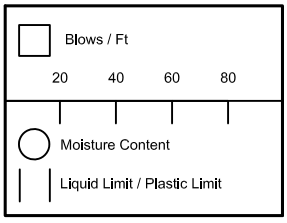
Relative Consistency

Fine - Grained Soils	
Relative Density	N, SPT Blows/Foot
Very Soft	< 2
Soft	2 - 4
Medium Stiff	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	> 30

Criteria for Describing Plasticity

Description	Criteria
Nonplastic	A ⅛" (3mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

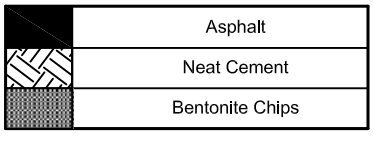
Test Symbols



Relative Density

Coarse - Grained Soils	
Relative Density	N, SPT Blows/Foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

Backfill Symbols



High/Low Water Level Screened Well Interval



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Key to Boring Logs - Rock

Rock Strength

Description	Recognition	Uniaxial Compressive Strength (psf)
Extremely Weak Rock	Indented by thumbnail	30 to 150
Very Weak Rock	Peeled by pocket knife	150 to 700
Weak Rock	Peeled with difficulty by pocket knife	700 to 3,600
Moderately Strong Rock	Indented 5 mm with sharp end of pick	3,600 to 7,200
Strong Rock	One hammer blow to fracture	7,200 to 14,500
Very Strong Rock	Many hammer blows to fracture	14,500 to 36,000
Extremely Strong Rock	Only chipped by hammer blows	> 36,000

Core Recovery Calculation (%)

$$\frac{\Sigma \text{ Length of recovered core}}{\text{Total Length of core run}} \times 100$$

RQD Calculation (%)

$$\frac{\Sigma \text{ Length of core pieces} > 4 \text{ in.}}{\text{Total Length of core run}} \times 100$$

Rock Weathering

Residual Soil	Entirely decomposed to secondary minerals; material can be easily broken by hand
Completely Weathered	Almost entirely decomposed to secondary minerals; material can be granulated by hand
Highly Weathered	More than half of the rock is decomposed
Moderately Weathered	Rock is discolored and noticeably weakened, but less than half is decomposed
Slightly Weathered	Rock is slightly discolored, but not noticeably lower in strength than fresh rock
Fresh	Rock shows no discoloration, loss of strength, or other effect of weathering or alteration

Discontinuity Type

J	Joint
FJ	Joint along foliation
S	Shear
F	Fault
HJ	Healed joint
MB	Mechanical break
B	Joint along bedding

Rock Fracture Spacing

Extremely Close Spacing	Fractures spaced less than 1 inch apart
Very Close Spacing	Fractures spaced 1 to 2.5 inches apart
Close Spacing	Fractures spaced 2.5 to 8 inches apart
Moderate Spacing	Fractures spaced 8 inches to 2 feet apart
Wide Spacing	Fractures spaced 2 to 6.5 feet apart
Very Wide Spacing	Fractures spaced 6.5 to 20 feet apart
Extremely Wide Spacing	Fractures spaced greater than 20 feet apart

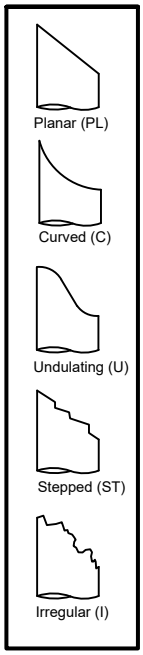
Sample Symbols

	HQ3 Rock Coring

Lithology Graphics

Basalt  Core Loss/ No Recovery 

Fracture Shape



Surface Roughness

Slickensided	Surface has smooth, glassy finish with visual evidence of striations
Smooth	Surface appears smooth and feels so to the touch
Slightly Rough	Asperities on discontinuity surfaces are distinguishable and can be felt
Rough	Ridges and side-angle steps are evident, surface feels very abrasive
Very Rough	Near vertical steps and ridges occur on discontinuity surface

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-1

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary and HQ Wireline/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **13.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **516.5 ft**	
Location: **Survey**	Coordinates: **7617396.39 E, 275319.73 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete - 18" thick (Pavement)		
							GM	Dense, moist, gray Silty Gravel (GM); Fine to coarse angular gravel, low plasticity silt (Base Aggregate)		At 2.5 feet very slow, very rough drilling. At 3.5 feet switch to rock coring.
512 / 5		100	RUN 1					BASALT, very strong (R5), slightly weathered to fresh, moderately to highly fractured, planar, stepped, smooth to rough joints with very narrow apertures (Little Butte Volcanic Series - Tholeiitic Basalt) *Run 1: 3.5-8.5 feet.* *RQD = 59%*		From 5.20 feet to 6.30 feet, UCS = 25,300 psi.
507 / 10		80	RUN 2					*Run 2: 8.5 -13.5 feet:* *RQD = 42%* *Planar and irregular, smooth to slightly rough joints.*		
502 / 15										Borehole completed at 13.5ft. below ground surface (bgs).
497 / 20										
492 / 25										
487 / 30										

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Boring B-1

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-2

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **16.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **518.2 ft**	
Location: **Survey**	Coordinates: **7617232.28 E, 275385.44 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514							OL/ OH	Organic Soil (OL/OH); Mulch (Fill)		
5/2/2018 1▼		47	S1	7-5-11 (N=16)			CL	Very stiff, moist, brown to gray brown, Sandy LEAN CLAY with Gravel (CL); Medium plasticity, medium to low toughness, fine to coarse sand, fine angular gravel (Fill)		
5		27	S2	2-4-4 (N=8)			SM	Loose, moist to wet, brown, Silty SAND with Gravel (SM); Fine to coarse sand, fine angular gravel, medium plasticity, slow dilatancy (Fill)		
		53	S3	2-3-1 (N=4)				Very loose, wet, brown, Silty SAND (SM); Fine to medium sand, low plasticity fines, rapid dilatancy (Fill)		
509										
10		73	S4	2-0-0 (N=WOR)			SM	*At 10.0 grades to orange-brown, occurrence of trace, fine, angular gravel, and slow dilatancy.*		
		33	S5	0-0-1 (N=1)						
504										
15		100	S5	17-18-27 (N=45)			GC	Very dense, moist, gray and olive-brown, CLAYEY GRAVEL with Sand (GC); Fine to coarse angular gravel, fine to coarse sand, medium plasticity fines (Fill)		Borehole completed at 16.5ft. below ground surface (bgs).
499										
20										
494										
25										
489										
30										

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Boring B-2

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-3

Date(s) Drilled: **05/02/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **12.5 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **529.9 ft**	
Location: **Survey**	Coordinates: **7617007.93 E, 275477.18 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 5		53	S1	3-2-1 (N=3)			CH	Soft, moist, gray with trace orange mottles, Sandy FAT CLAY (CH); High plasticity, medium toughness, fine sand, occasional organics (Fill)		
		60	S2	0-1-1 (N=2)				*At 5.0 feet grades to scattered woody organics.*		
		100	S3	1-1-1 (N=2)			SC	Very loose, moist to wet, gray, CLAYEY SAND (SC); Fine to medium sand, medium plasticity and medium toughness fines, occasional 1-inch sandy lenses of slow dilatancy (Fill)		
520 / 10		87	S4	0-16-49 (N=65)			SM	Medium dense, wet, red-brown, SILTY SAND (SM); Fine to medium sand, low plasticity fines, slow dilatancy (Fill)		
		0	S5	50/0" (Refusal)				Dark gray basalt chips in cuttings (Little Butte Volcanic Series - Tholeiitic Basalt)		At 11.0 feet very rough , very slow drilling.
515 / 15										Borehole completed at 12.5ft. below ground surface (bgs).
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring B-3

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-4

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.8 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **538.6 ft**	
Location: **Survey**	Coordinates: **7616842.35 E, 275514.57 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
534 5/2/2018 1		20	S1	7-10-7 (N=17)			SM	Medium dense, moist to wet, dark gray, SILTY SAND with Gravel (SM); Fine to medium sand, fine angular gravel, low plasticity fines, slow dilatancy, scattered organics (Fill)		
5		120	S2	28-50/3" (Refusal)			GM	Very dense, moist, gray and orange, SILTY GRAVEL with Sand (GM); Fine to coarse gravel, fine to coarse sand, medium plasticity fines (Fill)		At 4.5 feet very slow, very rough drilling.
529 10										Borehole completed at 5.8ft. below ground surface (bgs).
524 15										
519 20										
514 25										
509 30										

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Boring B-4

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring B-5

Date(s) Drilled: **05/02/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **Mud Rotary and HQ Wireline/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **4.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **528.8 ft**	
Location: **Survey**	Coordinates: **7617036.16 E, 275580.52 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
524 / 5		53	S1	1-5-6 (N=11)			ML	Stiff, moist, gray, Sandy SILT (ML); Low plasticity, medium toughness, fine sand, trace coarse sand, occasional organics (Fill)		
		53	S2	1-1-1 (N=2)			ML	Soft, moist to wet, green to red-brown, Sandy SILT (ML); Low plasticity, low toughness, fine to medium sand, occasional organics (Fill)		
10/29/2015 11:2016 1		73	S3	1-4-11 (N=15)			ML	Stiff, wet, gray and red-brown, Sandy SILT (ML); Low plasticity, medium toughness fines, fine sand, trace medium and coarse sand, occasional organics (Fill)		At 8.5 feet, more difficulty drilling, driller remarks likely weathered rock.
519 / 10		100	RUN 1					Run 1: 9.0 - 13.0 feet, RQD = 75%; BASALT, very strong (R5), slightly weathered to fresh, moderately to highly fractured, planar and curved, smooth to rough, high angle and sub-horizontal narrow joints (Little Butte Volcanic Series - Tholeiitic Basalt)		At 9.0 feet, switch to rock coring. RQD = 75%. From 11.7 feet to 12.4 feet UCS = 29,919 psi.
								Run 2: 13.0-18.0 feet, RQD = 86%, addition of irregular joints and < 0.1" thick light blue green staining/coating of occasional joints.		At 13.0 feet RQD = 86%.
514 / 15		100	RUN 2							
								Run 3: 18.0-23.0 feet, RQD = 74%, grade to medium strong based on testing		At 18.0 feet RQD = 74%. From 18.0 feet to 19.0 feet UCS = 6,932 psi.
509 / 20		100	RUN 3							
504 / 25										Borehole completed at 23ft. below ground surface (bgs).
499 / 30										

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Boring B-5

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-01

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **517.3 ft**	
Location: **Survey**	Coordinates: **7617295.47 E, 275346.48 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Dense, gray, Silty GRAVEL (GM); (Base Aggregate)		
513 / 5			S1				CL	Very soft to soft, moist, brown, LEAN CLAY with Sand (CL); Low plasticity, medium toughness, fine sand, trace medium sand, occasional organics (Fill)		At 9.0 feet driller remarks that the material stiffens.
508 / 10							GC	Very loose to loose, moist to wet, gray brown, CLAYEY GRAVEL with Sand (GC); Fine to coarse angular basalt gravel, fine to coarse sand, low plasticity fines (Fill)		At 10.0 feet, driller remarks that the material feels like rock but the auger is able to continue to spin. Auger refusal at 11 feet.
503 / 15										Borehole completed at 11ft. below ground surface (bgs).
498 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
493 / 25										
488 / 30										

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Boring P-01

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-02

Date(s) Drilled: **05/01/2018 - 01/05/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **526.1 ft**	
Location: **Survey**	Coordinates: **7617102.54 E, 275424.97 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
522 / 5							CL	Soft to very soft, moist, brown to light brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine angular gravel, occasional organics (Fill)		At 2.5 feet very slow, very rough drilling.
517 / 10										Auger refusal at 11.5 feet.
512 / 15										Borehole completed at 11.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
507 / 20										
502 / 25										
497 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-02

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-03

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **16.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.4 ft**	
Location: **Survey**	Coordinates: **7617036.27 E, 275432.54 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 / 0							GM	Asphalt (Pavement) Base rock (Fill) Very soft to soft, moist, dark gray-brown, LEAN CLAY with Sand (CL); Fine sand (Fill)		
5							CL			
4/30/2018 ▼										
521 / 10							CL	Very soft to soft, moist to wet, gray, Sandy LEAN CLAY (CL); Medium plasticity, fine to medium sand (Fill) *At 13.0 feet, grades to brown, moist to wet, decrease in sand content.*		
516 / 15										Auger refusal at 16 feet.
										Borehole completed at 16ft. below ground surface (bgs).
511 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
506 / 25										
501 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-03

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-04

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **7.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.8 ft**	
Location: **Survey**	Coordinates: **7616984.89 E, 275442.28 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
							GM	Dense, moist, gray Silty GRAVEL (GM); Fine to coarse angular gravel, low plasticity silt, 5 inches thick (Base Aggregate)		
							CL			
			S1				OL/ OH	Very soft to soft, moist, dark gray-brown, LEAN CLAY (CL); (Fill)		At 2.5 feet driller remarks that material becomes stiffer, woody material began smoking so driller added water to hole, very slow drilling. Organic chemical odor in the wood fiber of Sample 1.
526								Hard, moist, brown, Organic Soil with Sand (OL/OH); Frequent hard wood in clay (Fill)		
5								Very soft to soft, moist, green-brown with brown-orange mottles, LEAN CLAY (CL); Low plasticity, fine sand, trace medium sand (Fill)		
			S2				CL			Auger refusal at 7.5 feet.
521										Borehole completed at 7.5ft. below ground surface (bgs).
10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
516										
15										
511										
20										
506										
25										
501										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-04

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-05

Date(s) Drilled: **05/01/2018 - 05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **3.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **533.1 ft**	
Location: **Survey**	Coordinates: **7616928.58 E, 275458.29 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							CL	Very soft to soft, moist, brown to light brown, LEAN CLAY with Sand (CL); Low plasticity, medium toughness, fine sand, trace coarse angular gravel, occasional organics (Fill)		Auger refusal at 3.5 feet.
529 / 5										Borehole completed at 3.5ft. below ground surface (bgs).
524 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
519 / 15										
514 / 20										
509 / 25										
504 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-05

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-06

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **3.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **536.2 ft**	
Location: **Survey**	Coordinates: **7616858.52 E, 275586.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
			S1				CL	Stiff, moist to wet, brown, LEAN CLAY (CL); Low plasticity, medium toughness, trace fine to medium sand, fine gravel, occasional woody organics (Fill)		Auger refusal at 3.5 feet.
532 / 5										Borehole completed at 3.5ft. below ground surface (bgs).
527 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
522 / 15										
517 / 20										
512 / 25										
507 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-06

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-07

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **2.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **538.0 ft**	
Location: **Survey**	Coordinates: **7616789.32 E, 275532.46 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Very loose to loose, moist, dark brown, SILTY GRAVEL with Sand (GM); Angular fine to coarse gravel with cobbles, low plasticity fines (Fill)		Auger refusal at 2.5 feet.
533 5										Borehole completed at 2.5ft. below ground surface (bgs).
528 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
523 15										
518 20										
513 25										
508 30										

McMILLEN JACOBS ASSOCIATES

Boring P-07

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-08

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **7.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **535.2 ft**	
Location: **Survey**	Coordinates: **7616905.96 E, 275577.01 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
531 / 5			S1				GM	Very loose to loose, moist, dark brown, SILTY GRAVEL with Sand (GM); Fine to coarse angular to subangular gravel, fine to coarse sand, low plasticity fines, occasional woody organics (Fill)		Slight petroleum odor while drilling. Auger refusal at 7.5 feet.
526 / 10										Borehole completed at 7.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
521 / 15										
516 / 20										
511 / 25										
506 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-08

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-09

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **4.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.5 ft**	
Location: **Survey**	Coordinates: **7616966.80 E, 275594.59 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 5/2/2018 ▼ 5			S1				CL	Moist, gray-brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel, scattered organics (Fill)		Slight petroleum odor. Auger refusal at 4 feet.
										Borehole completed at 4ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
521 10										
516 15										
511 20										
506 25										
501 30										

McMILLEN JACOBS ASSOCIATES

Boring P-09

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-10

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **530.1 ft**	
Location: **Survey**	Coordinates: **7616963.18 E, 275547.22 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
526 0							GM	Very loose to loose, moist, brown, SILTY GRAVEL with Sand (GM); Fine to coarse gravel, fine and coarse sand, low plasticity. (Fill)		
5/1/2018 1							CL	Very soft to soft, wet, gray-brown, LEAN CLAY with Sand (CL); Low plasticity, fine sand, trace angular fine angular gravel. (Fill)		Auger refusal at 5.5 feet.
521 5										Borehole completed at 5.5ft. below ground surface (bgs).
516 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
511 15										
506 20										
501 25										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-10

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-11

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **529.8 ft**	
Location: **Survey**	Coordinates: **7617007.94 E, 275561.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 5			S1				GC	Very loose to loose, moist to wet, brown to gray brown, Clayey GRAVEL with Sand (GC); Fine to coarse gravel, fine to coarse sand (Fill)		Auger refusal at 5.5 feet.
520 10										Borehole completed at 5.5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
515 15										
510 20										
505 25										
500 30										

5/1/2018 1

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Boring P-11

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-12

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.0 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **526.4 ft**	
Location: **Survey**	Coordinates: **7617070.84 E, 275609.56 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
522 / 5			S1				CL	Very soft to soft, moist, brown, Gravelly LEAN CLAY with Sand (CL); Low plasticity, fine to coarse angular gravel, fine to coarse sand (Fill)		Auger refusal at 5 feet.
517 / 10										Borehole completed at 5ft. below ground surface (bgs). Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
512 / 15										
507 / 20										
502 / 25										
497 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-12

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-13

Date(s) Drilled: **04/30/2018 - 04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **8.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **523.6 ft**	
Location: **Survey**	Coordinates: **7617121.16 E, 275620.34 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
519 / 0							CL	Very soft to soft, moist to wet, dark brown to gray brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel (Fill)		Loose gravelly material begins caving at the ground surface.
5/6/2018 1										Auger refusal at 8.5 feet.
514 / 5										Borehole completed at 8.5ft. below ground surface (bgs).
509 / 10										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
504 / 15										
499 / 20										
494 / 25										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-13

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-14

Date(s) Drilled: **05/01/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **5.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **521.7 ft**	
Location: **Survey**	Coordinates: **7617149.97 E, 275571.01 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
517 / 5			S1				CL	Very soft to soft, wet, gray-brown, Sandy LEAN CLAY with Gravel (CL); Low plasticity, fine to coarse sand, fine angular gravel (Fill)		Observed groundwater at approximately 4.0 feet water present, difficult to measure due to gravel.
512 / 10										Auger refusal at 5.5 feet.
507 / 15										Borehole completed at 5.5ft. below ground surface (bgs).
502 / 20										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
497 / 25										
492 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-14

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-15

Date(s) Drilled: **04/30/2018**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Irizarry**	Checked By: **K. Elliott**
Drilling Method/ Rig Type: **4-1/4" Hollow stem auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **2.5 ft**	
Hole Diameter: **4.25 in**	Hammer Weight/Drop (lb/in.)/Type	Ground Surface Elevation/Datum: **519.1 ft**	
Location: **Survey**	Coordinates: **7617194.34 E, 275628.88 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
519 0							GC	Very loose to loose, moist to wet, brown, CLAYEY GRAVEL with Sand (GC); Fine angular gravel, fine to coarse sand (Fill)		Auger refusal at 2.5 feet.
4/30/2018 ▽										Borehole completed at 2.5ft. below ground surface (bgs).
515 5										Grab samples obtained from auger cuttings during exploration. Reported relative density and apparent consistency based on reactions while drilling.
510 10										
505 15										
500 20										
495 25										
490 30										

McMILLEN JACOBS ASSOCIATES

Boring P-15

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-16

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **26.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **517.1 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617309.79 E, 275352.81 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
513 / 5								Asphalt (Pavement) Soft, moist, brown, CLAY (CL) (Fill)		
							CL			
508 / 10										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
503 / 15										
498 / 20										
493 / 25										
										Borehole completed at 26ft. below ground surface (bgs).
488 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-16

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-17

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **11.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **516.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617358.56 E, 275414.92 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
								Soft, moist, brown, CLAY (CL) (Fill)		
							CL			
512 5										
								Basalt, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
507 10										
										Borehole completed at 11ft. below ground surface (bgs).
502 15										
497 20										
492 25										
487 30										

McMILLEN JACOBS ASSOCIATES

Boring P-17

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-18

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.5 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617209.77 E, 275451.86 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514 / 5							CL	Soft, moist, brown, CLAY (CL) (Fill)		
509 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
504 / 15										Borehole completed at 15ft. below ground surface (bgs).
499 / 20										
494 / 25										
489 / 30										

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Boring P-18

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-19

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.0 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617228.61 E, 275499.48 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
								Soft, moist, brown, CLAY (CL) (Fill)		
514							CL			
5										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
509										
10										
504										
15										
499										
20										Borehole completed at 20ft. below ground surface (bgs).
494										
25										
489										
30										

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-20

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **525.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617111.38 E, 275430.15 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
521 / 5							CL	Soft, moist, brown, CLAY (CL) (Fill)		
516 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
511 / 15										
506 / 20										Borehole completed at 20ft. below ground surface (bgs).
501 / 25										
496 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-20

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-21

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **521.8 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617111.78 E, 275548.31 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
517 / 5							GM	Loose, gray, silty GRAVEL (GM) (Fill)		
512 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
507 / 15										
502 / 20										
497 / 25										Borehole completed at 23ft. below ground surface (bgs).
492 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-21

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-22

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **20.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **518.5 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617179.82 E, 275578.51 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
514 / 5							CL	Soft, moist, brown, slightly sandy CLAY (CL) (Fill)		
509 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
504 / 15										
499 / 20										Borehole completed at 20ft. below ground surface (bgs).
494 / 25										
489 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-22

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-23

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **530.4 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617036.68 E, 275432.95 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, slightly silty GRAVEL (GM) (Fill)		
								Soft, moist, brown, CLAY (CL) (Fill)		
526 / 5							CL			
521 / 10										
516 / 15								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
511 / 20										There was no return of rock chips until 22 feet bgs. Driller commented that the hole was being plugged by dirt and preventing return of rock fragments.
506 / 25										Borehole completed at 23ft. below ground surface (bgs).
501 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-23

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-24

Date(s) Drilled: **10/30/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **529.7 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617008.03 E, 275578.53 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 0							GM	Loose, gray, silty GRAVEL (GM) (Fill)		
525 / 5								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		Driller commented that it got wet around 5 feet bgs.
520 / 10										
515 / 15										Borehole completed at 15ft. below ground surface (bgs).
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-24

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-25

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **15.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **506.4 ft**	
Location: **Pleasant Valley Boat Ramp**	Coordinates: **7617287.27 E, 275672.91 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt (Pavement)		
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
502								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
5										
497										
10										
492										
15										Borehole completed at 15ft. below ground surface (bgs).
487										
20										
482										
25										
477										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-25

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-26

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **23.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **507.2 ft**	
Location: **Pleasant Valley Boat Ramp**	Coordinates: **7617279.85 E, 275716.52 N**	Elevation Source: **Site Survey**	

ELEV. (FT) WATER LEVEL DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Medium dense, gray, silty GRAVEL (GM) (Fill)		
503 5								BASALT, fractured, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		Driller comments that between 5 and 12 feet bgs seemed like highly fractured rock.
498 10										
								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
493 15										
488 20										
483 25										Borehole completed at 23ft. below ground surface (bgs).
478 30										

McMILLEN JACOBS ASSOCIATES

Boring P-26

Project: Sweet Home WWTP Schematic Design
Project Location: Sweet Home, OR
Project Number: 5834.0

Log of Boring P-27

Date(s) Drilled: **10/29/2019**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **L. Ferguson**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **Air Track Probe/Furukawa HCR900**	Drilling Contractor: **McCallum Rock Drilling**	Total Depth of Borehole: **26.0 ft**	
Hole Diameter: **3.00 in**	Hammer Weight/Drop (lb/in.)/Type: **N/A**	Ground Surface Elevation/Datum: **516.6 ft**	
Location: **Sweet Home WWTP**	Coordinates: **7617372.72 E, 275312.04 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete (Pavement)		
								Soft, moist, brown, slightly sandy CLAY (CL) (Fill)		
512 / 5							CL			
507 / 10								BASALT, hard, gray (Little Butte Volcanic Series - Tholeiitic Basalt)		
502 / 15										
497 / 20										
492 / 25										
487 / 30										Borehole completed at 26ft. below ground surface (bgs).

McMILLEN JACOBS ASSOCIATES

Boring P-27

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-28

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 11.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 516.5 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617342.00 E, 275383.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
512 / 5		67	SPT-1	1-1-1 (N=2)			ML	Soft, moist, brown, SILT (ML); low plasticity, trace fine gravel, trace fine sand, trace wood fibers. (Fill)		
		100	G-1					*Becomes gray mottled at 5.5 feet.*		
507 / 10		64	SPT-2	1-7-50/3" (Refusal)				*10 - 11 feet: sample consists of approx. 50% wood fibers by volume.* *Auger refusal at 11.25 feet on basalt bedrock.*		Borehole completed at 11.25ft. below ground surface (bgs).
502 / 15										
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-28

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-29

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 19.0 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 517.3 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617301.00 E, 275320.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
								Base Aggregate - 3" thick (Fill)		
								Soft, moist, brown, SILT (ML); low plasticity, trace fine gravel, trace fine sand, trace wood fibers. (Fill)		
513		100	G-1							
5		20	SPT-1	1-0-2 (N=2)			ML			
		100	G-2							
508										
10		33	SPT-2	0-7-26 (N=33)				*Becomes wet at 10 feet.*		Auger grinding below 10 - 15 feet.
		100	G-3					BASALT; very weak, dark brown, highly weathered to decomposed (Little Butte Volcanic Series - Tholeiitic Basalt)		
		70	SPT-3	50/12" (Refusal)						
503										
15		98	SPT-4	26-50/5" (Refusal)				*Penetration rate decreases significantly at 15 feet; stronger rock inferred below this depth.*		Smooth, slow drilling below 15 feet.
		87	SPT-5	12-23-33 (N=56)				*Becomes dark blue-gray at 18 feet.*		
498										Borehole completed at 19ft. below ground surface (bgs).
20										
493										
25										
488										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-29

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-30

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 11.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 519.8 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617195.00 E, 275427.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
		100	G-1				ML	Moist, light brown, SILT with gravel (ML); low plasticity, fine to coarse angular gravel. (Fill)		
515 / 5		100	SPT-1	1-0-1 (N=1)			SM	Very soft, wet, light brown, Silty SAND (SM); fine to medium sand, low plasticity fines. (Fill)		
510 / 10		40	SPT-2	8-11-50/3" (Refusal)				*Basalt inferred below 11 feet.* *Auger refusal at 11.25 feet on basalt bedrock.*		Borehole completed at 11.25ft. below ground surface (bgs).
505 / 15										
500 / 20										
495 / 25										
490 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-30

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-31

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 12.7 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 520.8 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617173.00 E, 275391.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
								Base Aggregate - 1" thick (Fill)		
							ML	Moist, light brown, SILT with gravel (ML); low plasticity, fine to coarse angular gravel. (Fill)		
516 / 5		33	SPT-1	0-0-1 (N=1)			ML	Very soft, moist to wet, Sandy SILT (ML); fine to medium sand, low plasticity fines. (Fill)		
511 / 10		40	SPT-2	30-38-16 (N=54)				*Basalt inferred below 10 feet.*		Rod chatter begins at 9 feet and increases significantly below 10 feet.
		147	SPT-3	50/2" (Refusal)				*Auger refusal at 12.67 feet on basalt bedrock.*		Borehole completed at 12.67ft. below ground surface (bgs).
506 / 15										
501 / 20										
496 / 25										
491 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-31

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-32

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 10.2 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 530.4 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617027.00 E, 275515.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 6" thick (Pavement)		
								Base Aggregate - 2" thick (Fill)		
		100	G-1				ML	Moist, dark brown, SILT with gravel (ML); low plasticity, fine to coarse gravel. (Fill)		
526										
5		100	SPT-1	0-1-1 (N=2)			ML	Soft, moist, gray, SILT (ML); low plasticity, trace fine sand. (Fill) *Becomes gray at 4.5 feet.*		
521										Rod chatter below 9.5 feet bgs.
10		47	SPT-2	50/2" (Refusal)				*Auger refusal at 10.17 feet on basalt bedrock.*		Borehole completed at 10.17ft. below ground surface (bgs).
516										
15										
511										
20										
506										
25										
501										
30										

McMILLEN JACOBS ASSOCIATES

Boring P-32

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-33

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 3.7 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 529.6 ft	
Location: See Figure 2 Site Plan	Coordinates: 7616945.00 E, 275701.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
525 / 5		100	G-1				GM	Moist, brown, Silty GRAVEL (GM); fine to coarse gravel, non-plastic fines. (Fill)		Strong rod chatter from ground surface to 3.5 feet bgs.
		0	SPT-1	50/2" (Refusal)				*Basalt inferred below 3.5 feet.* *Auger refusal at 3.67 feet on basalt bedrock.*		Auger bit grinding at 3.5 feet. Borehole completed at 3.67ft. below ground surface (bgs).
520 / 10										
515 / 15										
510 / 20										
505 / 25										
500 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-33

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-34

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 15.0 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 516.9 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617301.00 E, 275494.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Asphalt - 5" thick (Pavement)		
							GM	Base Aggregate - 2" thick (Fill)		
								Moist, brown, Silty GRAVEL (GM); fine to coarse gravel, low plasticity fines. (Fill)		
		100	G-1					Soft to very soft, moist, brown, SILT (ML); low plasticity, trace fine sand. (Fill)		
512 / 5		40	SPT-1	1-1-3 (N=4)			ML			
507 / 10		33	SPT-2	1-0-1 (N=1)				*Becomes very soft, grades to Silt with sand at 10 feet.*		
502 / 15		100	SPT-3	50/2" (Refusal)				*Auger refusal at 15 feet on basalt bedrock.*		Borehole completed at 15ft. below ground surface (bgs).
497 / 20										
492 / 25										
487 / 30										

McMILLEN JACOBS ASSOCIATES

Boring P-34

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-35

Date(s) Drilled: 06/20/2022 - 06/20/2022	Geotechnical Consultant: McMillen Jacobs Associates	Logged By: A. Judy	Checked By: J. Quinn
Drilling Method/ Rig Type: 8.25" Hollow Stem Auger/CME 75	Drilling Contractor: PLI Systems, Inc.	Total Depth of Borehole: 7.1 ft	
Hole Diameter: 8.25 in	Hammer Weight/Drop (lb/in.)/Type: 140 lb / 30 in / Automatic	Ground Surface Elevation/Datum: 517.5 ft	
Location: See Figure 2 Site Plan	Coordinates: 7617255.00 E, 275628.00 N	Elevation Source: Site Survey	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
							GM	Moist, dark gray and brown, Silty GRAVEL (GM); fine to coarse gravel. (Fill)		Rod chatter from ground surface to 5 feet bgs.
							ML	Soft, moist, brown, SILT (ML); low plasticity, trace fine sand. (Fill)		
513 5		60	SPT-1	0-1-2 (N=3)						
		0	SPT-2	50/1" (Refusal)				*Basalt inferred below 6 feet.*		Rod chatter and difficulty anvancing auger below 6 feet.
								Auger refusal at 7.08 feet on basalt bedrock.		Borehole completed at 7.08ft. below ground surface (bgs).
508 10										
503 15										
498 20										
493 25										
488 30										

McMILLEN JACOBS ASSOCIATES

Boring P-35

Project: Sweet Home WWTP Final Design Review
Project Location:
Project Number: 6367.0

Log of Boring P-36

Date(s) Drilled: **11/22/2022**	Geotechnical Consultant: **McMillen Jacobs Associates**	Logged By: **J. Quinn**	Checked By: **J. Quinn**
Drilling Method/ Rig Type: **8.25" Hollow Stem Auger/CME 75**	Drilling Contractor: **Western States Soil Conservation, Inc.**	Total Depth of Borehole: **11.6 ft**	
Hole Diameter: **8.00 in**	Hammer Weight/Drop (lb/in.)/Type: **140 lb / 30 in / Automatic**	Ground Surface Elevation/Datum: **516.77 ft**	
Location: **SE Corner of WWTP Site**	Coordinates: **7617443.00 E, 275286.00 N**	Elevation Source: **Site Survey**	

ELEV. (FT) / WATER LEVEL / DEPTH (FT)	SAMPLE TYPE	RECOVERY (%)	SAMPLE #	BLOW COUNTS	PENETRATION RESISTANCE BLOWS/FT (BLOWS/FT 20 40 60 80; MC; LL/PL)	GRAPHIC LOG	USCS	MATERIAL DESCRIPTION	BACKFILL INFORMATION	REMARKS AND TESTS
								Concrete - 6" thick (Pavement)		
								Base Aggregate - 6" thick (Fill)		
								Stiff, moist, brown with orange mottling, LEAN CLAY (CL); low to medium plasticity, trace coarse rounded gravel, trace fine sand. (Fill)		
		55	SPT-1	2-8-7 (N=15)						
-5 5								*Becomes medium stiff at 5 feet bgs.*		
		50	SPT-2	2-3-4 (N=7)			CL			
		60	SPT-3	50/5" (Refusal)				*Boulders/cobbles likely from 7.5 to 9.0 feet bgs.*		Slow, difficult drilling from 7.5 to 9 feet bgs.
								Becomes stiff at 9.0 feet bgs.		Drillers cracked auger transfer rod at approximately 8.5 feet bgs. Abandoned original boring at 8.5 feet bgs due to being off vertical alignment and moved about 4 feet west to re-drill boring.
-10 10		100	SPT-4	3-3-9 (N=12)				*Becomes gray with rootlets at 10 feet bgs.*		
								Basalt inferred below 10.75 feet bgs.		Difficult, slow drilling below 10.75 feet bgs. 30 minutes to advance from 10.75 to 11.5 feet bgs.
		800	SPT-5	50/0" (Refusal)						Borehole completed at 11.6ft. below ground surface (bgs).

McMILLEN JACOBS ASSOCIATES

Boring P-36

Appendix B

Laboratory Test Results

Northwest Testing, Inc.
A Division of Northwest Geotech, Inc.
9120 SW Pioneer Court, Suite B, Wilsonville, Oregon 97070 | ph: 503.682.1880 fax: 503.682.2753 | www.nwgeotech.com

TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Report of: Atterberg limits, moisture content, and compressive strength of rock

Sample Identification

NTI completed Atterberg limits, moisture content, and compressive strength of rock testing on samples delivered to our laboratory on May 9, 2018 by a McMillen Jacobs Associates representative. Testing was performed in accordance with the standards indicated. Our laboratory test results are summarized on the following tables and attached pages.

Laboratory Test Results

Atterberg Limits (ASTM D 4318)			
Sample ID	**Liquid Limit**	**Plastic Limit**	**Plasticity Index**
B-3 S-2 @ 5 – 6.5 ft.	51	28	23
B-5 S-1 @ 2.5 – 4 ft.	44	28	16

Moisture Content of Soil (ASTM D 2216)	
Sample ID	**Moisture Content (Percent)**
B-3 S-2 @ 5 – 6.5 ft.	44.8
B-5 S-1 @ 2.5 – 4 ft.	26.3

Copies: Addressee

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TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Laboratory Testing

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-1 R-1 @ 5.2 – 6.3 ft.	2.41	4.88	100	25,302



Photo1: As received sample



Photo 2: Test sample before testing



Photo 3: Test sample after testing

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Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Laboratory Testing

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-5 R-1 @ 11.7 – 12.4 ft.	2.41	4.85	100	25,919



Photo1: As received sample

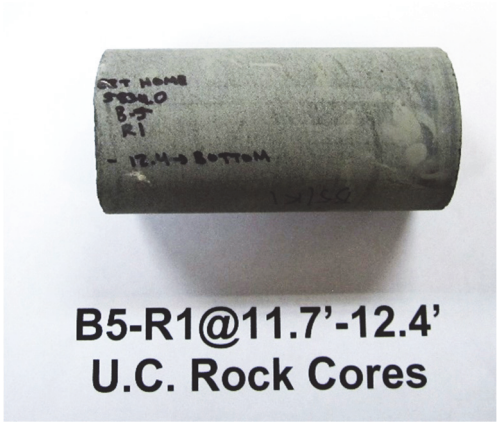


Photo 2: Test sample before testing



Photo 3: Test sample after testing

Laboratory Testing

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TECHNICAL REPORT

Report To:	Mr. Farid Sariosseiri McMillen Jacobs Associates 1500 SW First Avenue, Suite 750 Portland, Oregon 97201	**Date:** **Lab No:**	5/14/18 18-108
Project:	Laboratory Testing – Sweet Home WWTP 5834.0	**Project No.:**	2286.1.1

Compressive Strength of Intact Rock Core Specimens (ASTM D 7012 Method C)				
Sample ID	**Diameter (inches)**	**Height (inches)**	**Rate of Loading (lbs/s)**	**Uniaxial Compressive Strength (psi)**
B-5 R-2 @ 18 – 19 ft.	2.41	4.86	100	6932

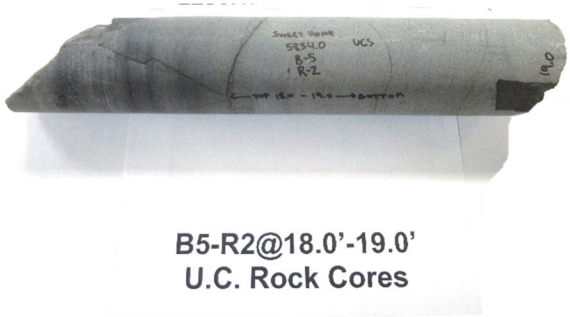


Photo1: As received sample

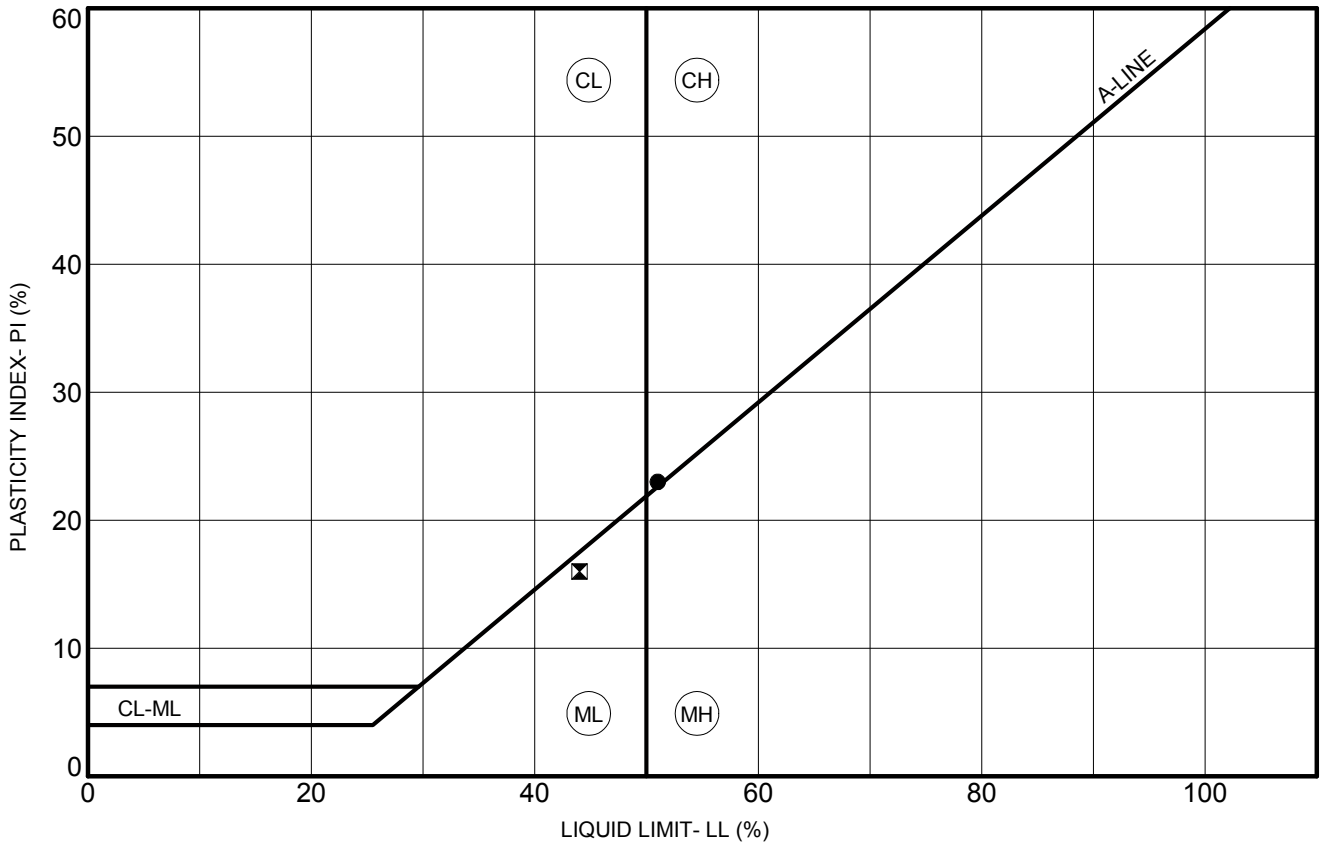


Photo 2: Test sample before testing



Photo 3: Test sample after testing

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	Sample ID	Depth (ft)	Moisture Content %	LL	PL	PI	% Pass #200	Classification
●	**B-03**	**5.0**	**(44.8)**	**51**	**28**	**23**		**CH**
⧓	**B-05**	**2.5**	**(26.3)**	**44**	**28**	**16**		**ML**

McMILLEN JACOBS ASSOCIATES

1500 SW 1ST AVE STE 750
PORTLAND, OR 97201
TELEPHONE: 503.384.2906

ATTERBERG LIMITS

Project: Waste Water Treatment Plant - Schematic Design
Number: 5834.0
Sample Location: Sweet Home
Testing Agency: Northwest Testing, Inc.

JA_ATTERBERG_PORTLAND OFFICE ADDRESS_5834.0 SWEET HOME.GPJ_JACOBS DATA TEMPLATE_GENERAL SOIL PROJECTS.GDT 6/11/18 REV-

Point Load Strength Index Test Results ASTM D-5731

PROJECT:	Sweet Home WWTP	**LAB SAMPLE NO.:**	
PROJECT NO.:	5834.0	**SAMPLE NO.:**	5834.0 - B-5
PROJECT LOCATION:	Sweet Home, OR	**SAMPLE DESCRIP:**	Basalt
SAMPLED BY:	Julia Irizarry	**DATE REPORTED:**	5/11/2018
DATE SAMPLED:	5/2/2018	**REPORTED BY:**	Devin Roth

Sample No.	Test Number	Test Type*	Rock Type	Width, W	Depth or Diameter, D	Failure Load, P	De^2	Point Load Strength Index, $I_{s(50)}$	Uniaxial Compressive Strength, UCS
				(in)	(in)	(lbs)	(in^2)	(psi)	(psi)
1	1	d	Basalt	5.31	2.36	5959	10313	513	12563
2	2	d	Basalt	5.91	2.36	3828	11459	304	7437
2B	3	d	Basalt	3.23	2.36	5158	6264	653	13717
3	4	d	Basalt	10.04	2.36	5104	19481	268	5098
3B	5	d	Basalt	5.59	2.36	6882	10848	569	13951
5	6	d	Basalt	6.69	2.36	8044	12987	579	13315
6	7	d	Basalt	5.12	2.36	4598	9931	407	9778
7	8	d	Basalt	4.13	2.36	6830	8021	714	17138
8	9	d	Basalt	11.42	2.36	8044	22154	383	9185
9	10	d	Basalt	5.20	2.36	7882	10084	690	14493
							Min	**268**	**5098**
							Max	**714**	**17138**
							Avg	**508**	**11667**

Size Corrected Point Load Index, $Is_{(50)}$

$I_{s(50)}$ = **508 psi** or **73,159 psf** or **3.5 MPa**

Mean Uniaxial Compressive Strength, σ_c

σ_c = **11,667 psi** or **1,680,111 psf** or **80 MPa**

*Test Type

d = diametral
a = axial
b = block
l= lump

Appendix C

Rock Core Photos



BOREHOLE B-01, 3.5 TO 13.5 FEET



BOREHOLE B-05, 9.0 TO 16.3 FEET

McMILLEN JACOBS ASSOCIATES	**SWEET HOME WWTP SCHEMATIC DESIGN GEOTECHNICAL DATA REPORT**	**JULY 2022**
	CORE PHOTOGRAPHS	**FIGURE C - 1**



BOREHOLE B-05, 16.3 TO 23 FEET

Appendix D

RMR Calculation

The Rock Mass Rating System

Geomechanics Classification of Rock Masses

After Z.T. Bieniawski, 1989

McMILLEN JACOBS ASSOCIATES

1500 SW First Avenue, Suite 750, Portland, OR

Project: **Sweet Home WWTP**
Date: **5/16/2018**
Location:
Boring: **B-1 &B-5**
Geologist/Engineer: **Farid Sariosseiri**
Rock Type: **Bedded Volcaniclastics**
Elevation, ft:

Rock Mass Property Input

Strength of Intact Rock, Mpa	**135**
Point Load ?	**N**
Uniaxial Compressive ?	**Y**
Bieniawski Rating	**12**
RQD, %	**67**
Bieniawski Rating	13
Discontinuity Spacing, mm	**150**
Bieniawski Rating	**7**

Conditions of Discontinuitites	**Rating**
1. Very rough surfaces, not continuous, no separation, and unweathered rock walls.	**30**
2. Slightly rough surfaces, separation < 1 mm, and slightly weathered walls.	**25**
3. Slightly rough surface, separation < 1 mm, and highly weathered walls.	**20**
4. Slickenslided surfaces -or- gouge (infilling), 1-5 mm thick -or- separation 1-5 mm and continuous.	**10**
5. Soft gouge > 5 mm -or- separation > 5 mm and continuous	**0**
Bieniawski Rating?	**25**

Groundwater Conditions	**Rating**
Conditions include:	
A. Inflow per 10 m of tunnel length (L/m),	
B. Ratio of joint water pressure to σ_1,	
C. General conditions.	
1. No inflow -or- 0 ratio -or- completely dry.	**15**
2. < 10 L/min -or- < 10 ratio -or- damp.	**10**
3. 10-25 L/min inflow -or- 0.1-0.2 ratio -or- wet.	**7**
4. 22-125 L/min inflow -or- 0.2-0.5 ratio -or- dripping.	**4**
5. > 125 L/min inflow -or- > 0.5 ratio -or- flowing.	**0**
Bieniawski Rating?	**15**

Orientation of Discontinuities	**Rating**		
	Tunnels	Foundations	Slopes
Very Favorable	**0**	**0**	**0**
Favorable	**-2**	**-2**	**-5**
Fair	**-5**	**-7**	**-25**
Unfavorable	**-10**	**-15**	**-50**
Very Unfavorable	**-12**	**-25**	**-60**
Bieniawski Rating?			**-5**

Overall RMR	**67**	
Class	**II**	**Good Rock**

GSI **62**

Mahler Water Reclamation Facility (MWRF) Interim Improvements

ADDENDUM NO. 3

FOR

SLUDGE BLEND TANK DESIGN-BUILD

To: All Prospective Bidders

The following clarifications, changes, additions and/or deletions are hereby made a part of the Contract Documents issued for the above referenced project as fully and completely as if the same were fully set forth therein.

This Addendum consists of 10 pages, including this cover.

BIDDER QUESTIONS

Q1. Is prequalification necessary to bid on this project?
A. No, prequalification is not necessary for this project.

Q2. Can a disposal site be identified in the Contract Documents for disposal of the solidified lime and the biofilter?
A. It is the responsibility of the Contractor to find a suitable disposal site.

Q3. What water source is to be used for the tank hydraulic testing?
A. Fill water is available on-site. Design-Builder is responsible to ensure adequate backflow prevention measures are in place. Coordinate with and obtain Owner approval prior to beginning this work.

Q4. Where can the water used for hydraulic testing be disposed of?
A. Dispose of water used for testing of the tank into the Special Manholes adjacent to the Influent Pump Station (IPS) that convey sewage to the IPS. Obtain Owner approval before disposing of water used for testing. See sheet C-005 for IPS and Special Manhole locations. Water shall be disposed of at a rate of 200 gallons per minute or less.

CHANGES AND ADDITIONS AND/OR DELETIONS

Additions are shown in underline. Deletions are shown in strikeout.

1. Exhibit A:

Add: Sheet C-005: SITE DEMOLITION & TREE REMOVAL.

2. Exhibit A: Sheet C-010, C-020, and M-250

Replace Sheets with revised Attached Sheets.

3. Technical Specifications

Add: Section 02 41 00 in its entirety.

4. Specification Section 31 10 00, Site Preparation

Add: Section 3.07, Tree Removal:

3.07. TREE REMOVAL

A. Remove specific trees indicated on the Drawings for removal.

B. Timber Salvage: Property owners have the rights to any tree with caliper of 6 inches and larger that are felled. The Engineer will notify property owners at least 48 hours prior to tree removal. If property owners elect to keep felled trees, they will be granted 7 calendar days after the tree is felled to remove the timber. If timber is not removed after 7 calendar days, the ownership of the timber shall revert back to Contractor.

End of Addendum No. 3

Mr. Greg Springman, Public Works Director	January 12, 2023 Date

TO PLEASANT VALLEY ROAD

BOAT RAMP ACCESS DRIVE

ALBANY AND EASTERN RAILROAD

EXIST BATHROOM TO REMAIN

EXIST STRIPING TO REMAIN

EXIST TREE TO REMAIN

EXIST SC TO REMAIN

EXIST S/W TO REMAIN

EXIST RETAINING WALL TO REMAIN

EXIST AERATION BASIN TO REMAIN

EXIST CHLORINE CONTACT CHAMBER TO REMAIN

EXIST FENCE TO REMAIN

EXIST CARPORT TO REMAIN

EXIST BUILDING TO REMAIN

EXIST RAS/WAS PS TO REMAIN

EXIST QUONSET BUILDING TO REMAIN

EXIST TREES TO BE REMOVED SEE NOTE 7

EXIST SC TO REMAIN

EXIST BUILDING TO REMAIN

EXIST SHED TO REMAIN

EXIST S/W TO REMAIN

EXIST SIGNS TO REMAIN

EXIST WASTE BACKWASH STORAGE TO REMAIN.

EXIST AEROBIC DIGESTER TO REMAIN

EXIST SHED TO REMAIN

EXIST FENCE TO REMAIN, TYP

EXIST HYDRANT TO REMAIN

EXIST SOLIDS BUILDING TO REMAIN

EXIST BLDG TO REMAIN

EXIST BIOFILTER TO BE REMOVED. SEE NOTE 9

EXIST BACKWASH STORAGE STRUCTURE TO REMAIN

EXIST IPS STRUCTURE TO REMAIN

EXIST SPECIAL MANHOLE #1 TO REMAIN

EXIST SPECIAL MANHOLE #2 TO REMAIN

EXIST FENCE TO BE REMOVED

EXIST CURB TO BE REMOVED APPROX 50 LF VERIFY LIMITS W/OWNER

EXIST PARTIALLY FILLED LIME SILO TO BE REMOVED SEE NOTE 8

PLAN
SCALE: 1"=30'

DEMOLITION LEGEND

- FENCE/SIGN DEMOLITION
- PAVEMENT AND CURB DEMOLITION
- BUILDING AND TANK DEMOLITION
- CONCRETE FLATWORK DEMOLITION
- TREE REMOVAL

SITE DEMOLITION NOTES:

1. CONTRACTOR SHALL PROTECT ALL EXISTING SURFACES, PIPES, VALVES, EQUIPMENT, AND OTHER ITEMS NOT IDENTIFIED TO BE DEMOLISHED.
2. DEMOLITION, ABANDONMENT, SALVAGE, AND DISPOSAL OF EXISTING EQUIPMENT SHALL BE PERFORMED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
3. SALVAGED EQUIPMENT DELIVERY POINT SHALL BE AT A LOCATION DESIGNATED BY THE CITY.
4. CONTRACTOR SHALL REPAIR AT CONTRACTOR'S EXPENSE ANY EXISTING STRUCTURES THAT WERE CALLED OUT TO REMAIN DAMAGED DURING CONSTRUCTION.
5. STRUCTURES SHALL BE REMOVED IN FULL INCLUDING ALL WALLS, FOOTINGS, SLABS, INCLUDING ANY PART OF THE STRUCTURE THAT IS BELOW GRADE UNLESS OTHERWISE NOTED.
6. MAINTAIN ACCESS TO THE EXISTING BOAT RAMP NORTH OF THE MWRF SITE AT ALL TIMES DURING CONSTRUCTION.
7. CONTRACTOR TO REMOVE ALL TREES WITHIN THE FENCE LINE. QUANTITY SHOWN IS APPROXIMATE. CONTRACTOR TO VERIFY.
8. CONTRACTOR TO DISPOSE OF SOLIDIFIED LIME FROM THE LIME SILO AT AN APPROVED ENVIRONMENTAL LANDFILL. QUANTITY OF LIME IN THE LIME SILO IS UNKNOWN.
9. CONTRACTOR TO SALVAGE ECO-BLOCKS FROM THE BIOFILTER. SEE NOTE 3.

NO.	DATE	BY	REVISION
1	01/09/2023	BVB	ADDENDUM 3

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

BVB DESIGNED
BVB DRAWN
WJM CHECKED

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION
JAN 2023
West Yost

WEST YOST
Water. Engineered.

Sweet Home Oregon at its best!

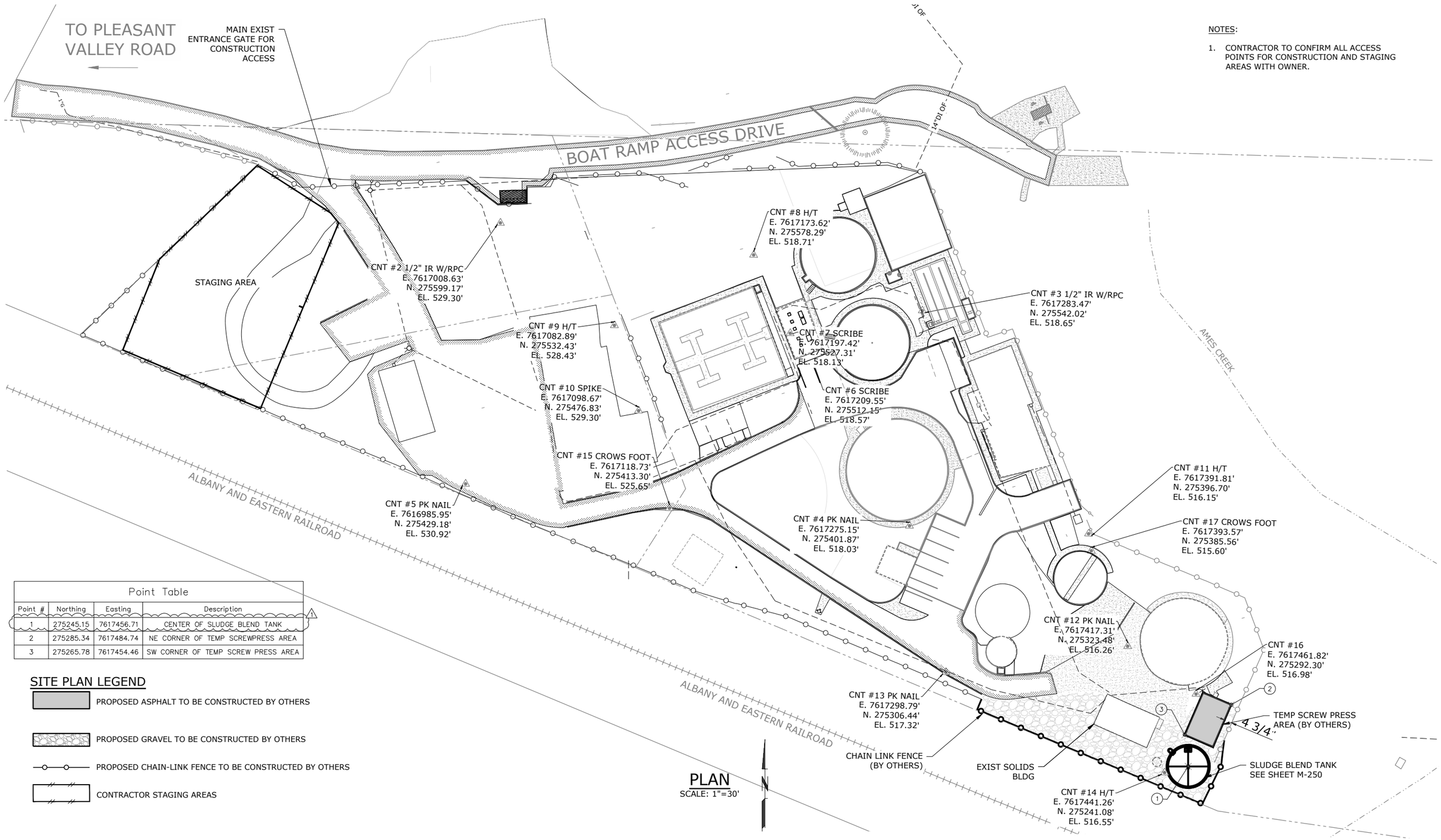
MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK DESIGN BUILD

SITE DEMOLITION & TREE REMOVAL PLAN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
C-005
XX of XX

P:\Clients\936 City Of Sweet Home\50-21-09 WWTP Phase 1 Final Design\CAD\Production\Sludge Blend Tank DB\19-2605-OR-C-SBT-DEMO.dwg C-005 1/12/2023 10:26 AM BBARRY 24.1s (LMS Tech)



NOTES:

1. CONTRACTOR TO CONFIRM ALL ACCESS POINTS FOR CONSTRUCTION AND STAGING AREAS WITH OWNER.

Point Table			
Point #	Northing	Easting	Description
1	275245.15	7617456.71	CENTER OF SLUDGE BLEND TANK
2	275285.34	7617484.74	NE CORNER OF TEMP SCREWPRESS AREA
3	275265.78	7617454.46	SW CORNER OF TEMP SCREW PRESS AREA

SITE PLAN LEGEND

- PROPOSED ASPHALT TO BE CONSTRUCTED BY OTHERS
- PROPOSED GRAVEL TO BE CONSTRUCTED BY OTHERS
- PROPOSED CHAIN-LINK FENCE TO BE CONSTRUCTED BY OTHERS
- CONTRACTOR STAGING AREAS

NO.	DATE	BY	REVISION
1	01/09/2023	BVB	ADDENDUM 3

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SLUDGE BLEND TANK
DESIGN BUILD

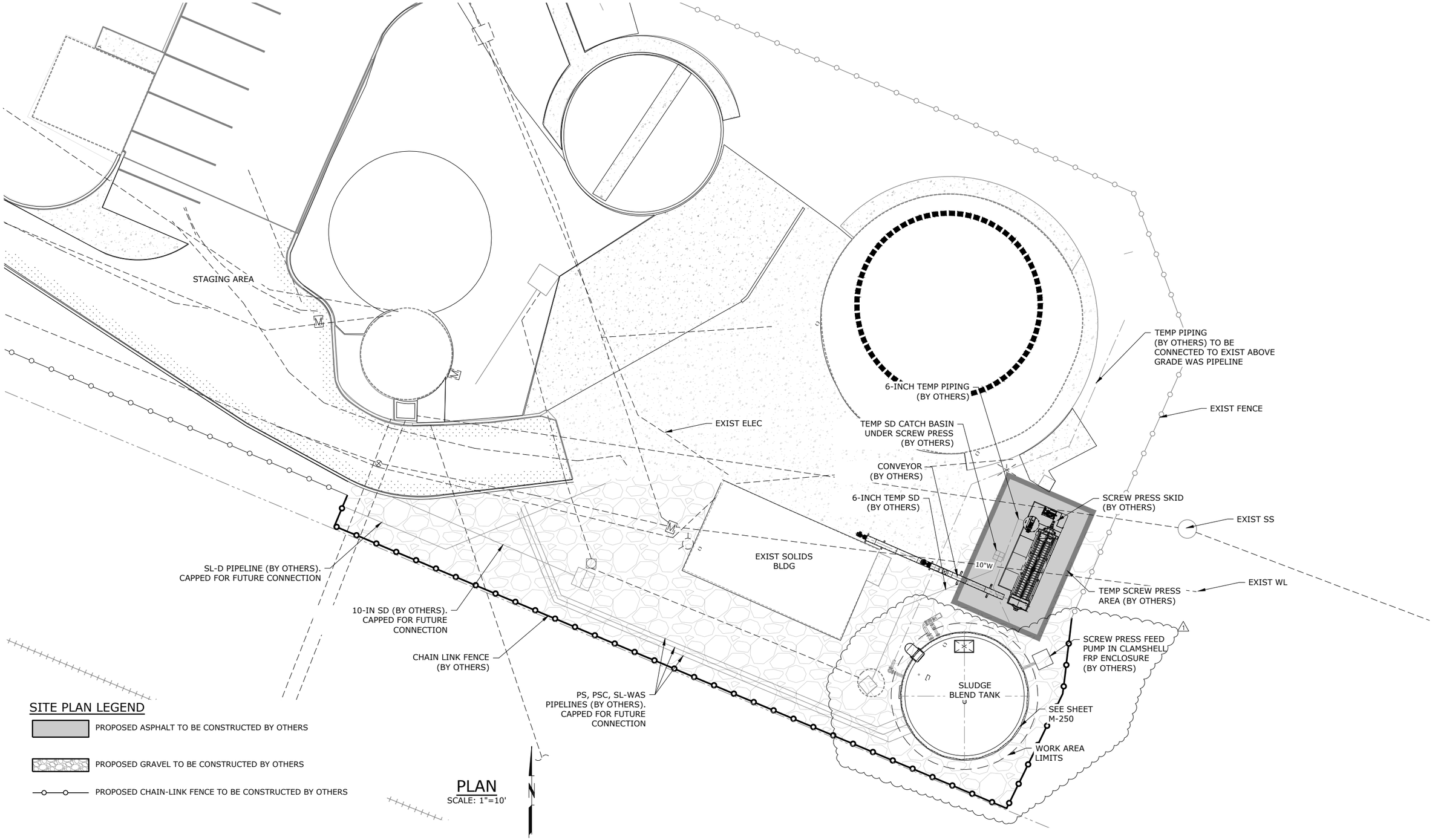
OVERALL SITE PLAN, STRUCTURE COORDINATES, STAGING AND ACCESS, SURVEY CONTROL POINTS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
C-010
XX of XX

P:\Clients\936 City Of Sweet Home\50-21-09 WWTP Phase 1 Final Design\CAD\Production\Sludge Blend Tank DB\19-2605-OR-C-SITE-SBT-DB.dwg C-010 1/9/2023 9:47 AM BBARRY 24.1s (LMS Tech)

P:\Clients\936 City Of Sweet Home\50-21-09 WWTP Phase 1 Final Design\CAD\Production\Sludge Blend Tank DB\19-2605-OR-C-SITE-SBT-DW-PP.dwg C-020 1/9/2023 12:51 PM BBARRY 24.1s (LMS Tech)



PLAN
SCALE: 1"=10'

NO.	DATE	BY	REVISION
1	01/09/2023	BVB	ADDENDUM 3

NOTICE
0 ½ 1
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BVB DRAWN
WJM CHECKED

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JAN 2023
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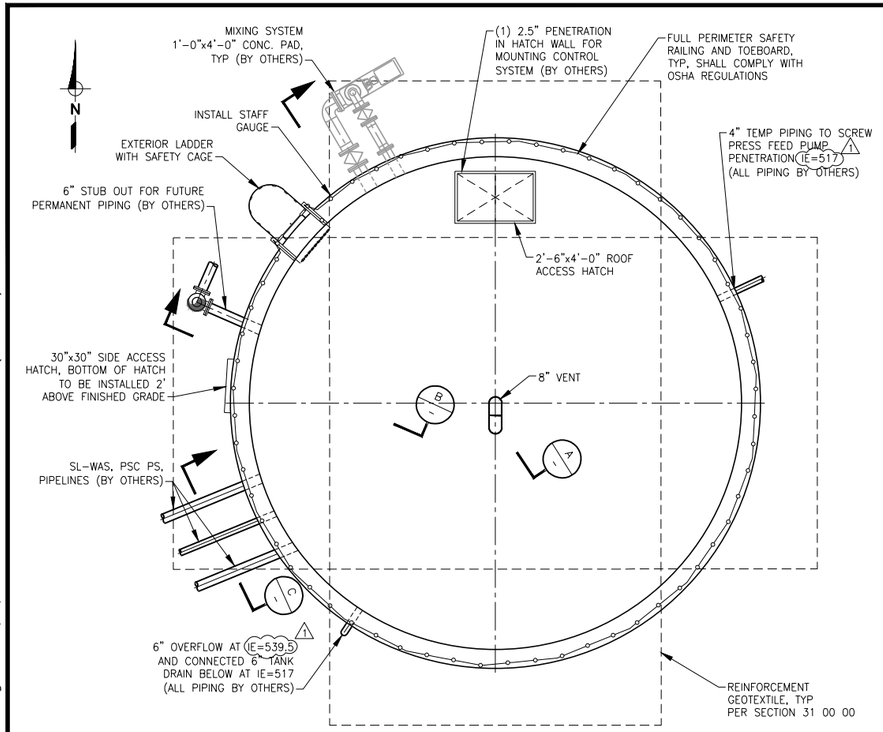
Sweet Home
Oregon at it's best!

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SLUDGE BLEND TANK
DESIGN BUILD

SOLIDS AREA DETAIL PLAN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

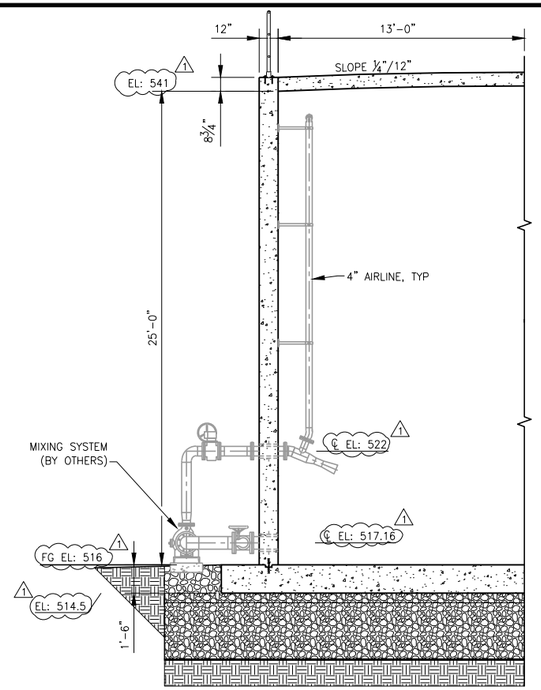
SHEET
C-020
3 of XX



SLUDGE BLEND TANK

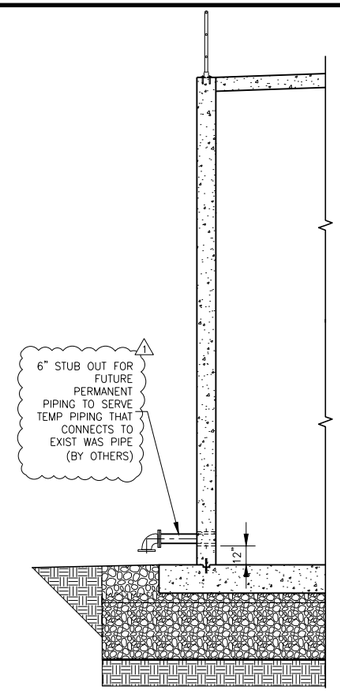
PLAN

SCALE: 1/4"=1'-0"



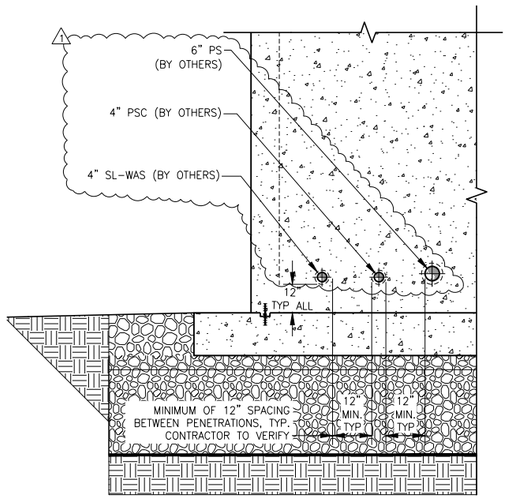
SECTION A

SCALE: 1/4"=1'-0"



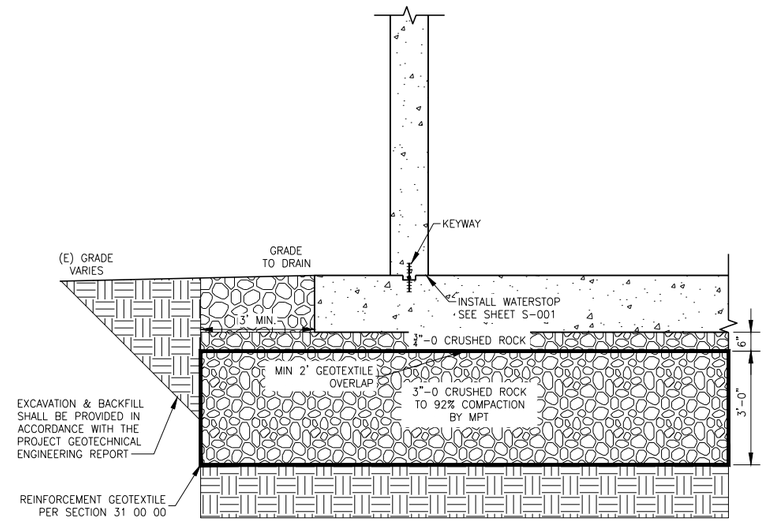
SECTION B

SCALE: 1/4"=1'-0"



SECTION C

SCALE: 3/8"=1'-0"



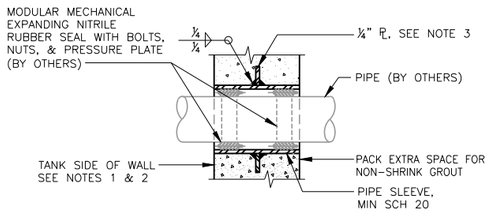
FOUNDATION SURFACE PREPARED TO THE SATISFACTION OF THE PROJECT GEOTECHNICAL ENGINEER.

CONTRACTOR SHALL CONFORM WITH GEOTECHNICAL REPORT

TYPICAL BURIED TANK SECTION

DETAIL 1

NOT TO SCALE



TANK WALL PIPE PENETRATION (DOUBLE LINK SEAL)

DETAIL 2 TYP

NOT TO SCALE

NOTES:
1. SLEEVE DIAMETER SHALL BE AS RECOMMENDED BY THE MECHANICAL SEAL MANUFACTURER.
2. SLEEVE NOT REQUIRED FOR PENETRATION IN EXISTING WALLS.
3. WEEP RINGS SHALL HAVE A MINIMUM DIAMETER EQUAL TO THE PIPE OR PIPE SLEEVE OUTSIDE DIAMETER PLUS 3-INCHES.
4. "TANK SIDE OF WALL" SHALL MEAN SIDE OF WALL NORMALLY EXPOSED TO LIQUID, EARTH, OR OUTSIDE ATMOSPHERE.
5. SEAL WITH MASTIC SEALANT WHERE WALL IS EXPOSED TO LIQUID, EARTH, OR EXPLOSION HAZARD AREA.

NO.	DATE	BY	REVISION
1	01/13/2023	BVB	ADDENDUM 3

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

EMR DESIGNED
SMB DRAWN
TRB CHECKED

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SLUDGE BLEND TANK
DESIGN BUILD

SLUDGE BLEND TANK AND MIXING SYSTEM
PLAN, SECTIONS AND DETAILS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
M-250
XX of XX

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SECTION 02 41 00

DEMOLITION, SALVAGE AND ABANDONMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Demolition, salvage, and abandonment of existing facilities.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 31 00 00 – Earthwork

1.03 SUBMITTALS

A. Comply with Section 01 33 00.

B. Description of removal procedures for careful removal of materials and equipment and the protection of facilities which are to remain undisturbed.

C. Time schedule for demolition work. Show demolition in relation to new construction, including any temporary facilities.

1.04 EXISTING CONDITIONS

A. Prior to the submittal of Bids, Contractor shall visit the site and inspect all facilities to become familiar with existing conditions and utilities.

1.05 REGULATORY REQUIREMENTS

A. Dispose of debris offsite in accordance with the requirements of agencies having jurisdiction.

B. Comply with applicable air quality control regulations.

C. Obtain necessary permits for building demolition, transportation of debris to disposal site(s) and dust control.

D. Erect appropriate safety devices to protect the general public, Owner's operations personnel, and workers from the hazards of demolition activities. Install barriers, guard rails and fences, and provide appropriate warning signs.

1.06 BURNING

A. The use of burning at the project site for the disposal of refuse, debris, and waste materials will not be permitted.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. The Drawings identify the major equipment and facilities to be demolished, salvaged, or abandoned. Auxiliary utilities such as water, air, drainage, lubrication oil, electrical wiring, controls, and instrumentation are not necessarily shown. Remove auxiliary utilities, as well as equipment and pipe supports and associated instrumentation devices pertaining to piping or equipment designated to be removed.

3.02 PROTECTION OF EXISTING FACILITIES

A. Before beginning any cutting, trenching, or demolition work, carefully survey the existing work and examine the Contract Documents to determine the extent of the Work.

B. Take precautions to prevent damage to facilities which are to remain in place or are to be salvaged, and be responsible for any damages to these facilities resulting from this work. Repair or replace damages to such work to return the facilities to its pre-existing condition at no additional cost to the Owner.

3.03 DEMOLITION

A. Demolish structures and equipment in an orderly and safe manner.

B. Dispose of material not identified for salvage or re-installation at a new location.

C. Minimize dust by sprinkling with water.

D. Backfill excavations caused by demolition in accordance with Section 31 00 00.

3.04 SALVAGE

A. Carefully remove and salvage, for reuse by the Owner, items, if any, identified on the Drawings

B. Remove salvage items in their largest pieces that can be easily handled and stored by Owner's personnel. Remove these items from their existing location and deliver them to a location designated by the Owner.

C. Remove items to be salvaged in a workmanlike manner and take the necessary precautions to prevent damage to the materials and equipment.

3.05 BURIED PIPELINES

A. Where buried pipelines are shown to be removed on the Drawings, they may be abandoned in place if there is no conflict with proposed construction and they are not located under or within 10 feet of any proposed structure.

3.06 ASBESTOS CEMENT PIPE

A. Remove and dispose of asbestos cement pipe disturbed during the performance of the Work. Remove and dispose in accordance with all Federal, State, and local laws, regulations, requirements, and guidelines.

B. Notify all appropriate authorities prior to performing work related to removal and disposal of asbestos cement pipe.

C. Provide landfill disposal weight records to Engineer for use as the basis of unit price payment.

D. Where necessary to connect into existing City asbestos cement potable water lines, perform work in accordance with all Federal, State, and local laws, codes, requirements, and guidelines.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. Concrete, site debris, rubbish, and other materials resulting from demolition operations, as well as mechanical and electrical equipment designated to be demolished, shall be the property of the Contractor and shall be legally disposed of at the Contractor's expense.

3.08 CLEANING

A. During and upon completion of the demolition operations, promptly remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave work areas in a clean condition.

B. Do not sweep, grade, or flush surplus materials, rubbish, or debris into storm drains, channels, lakes, or streams.

END OF SECTION

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Mahler Water Reclamation Facility (MWRF) Interim Improvements

ADDENDUM NO. 4

FOR

SLUDGE BLEND TANK DESIGN-BUILD

To: All Prospective Bidders

The following clarifications, changes, additions and/or deletions are hereby made a part of the Contract Documents issued for the above referenced project as fully and completely as if the same were fully set forth therein.

This Addendum consists of 6 pages, including this cover.

BIDDER QUESTIONS

Q1. Would it be possible to predetermine the trees prior to falling them that the city would like to keep?

A. The City does not want to salvage the trees removed as part of this contract. See updates to the demo sheet, C-005 for trees to be removed.

Q2. Once the trees and stumps are removed what would you like to be placed in the root areas? This can disturb a decent footprint depending on the size of tree.

A. Trees removed within the tank footprint must adhere to the requirements of drawing M-250, the Project geotechnical engineering report, and the specifications. Trees outside of the tank area should be backfilled with general fill meeting the requirements of Section 31 00 00-2.01.A, compacted to 90% of Maximum Dry Density of Compacted Material per ASTM D1557.

Q3. Is it possible to define the area of the site to be finished with gravel?

A. See revised attached drawings.

Q4. We anticipate taking the fencing out in the working areas and disposed of. Are you looking for us to put in temporary fencing?

A. Yes, install 6-foot-tall, post mounted, temporary chain link fencing with 3 strands of 4-point barbed wire, bent at 45-degrees outward from the site.

CHANGES AND ADDITIONS AND/OR DELETIONS

Additions are shown in underline. Deletions are shown in strikeout.

1. Exhibit A; Sheet C-005, C-010, and Sheet C-020:

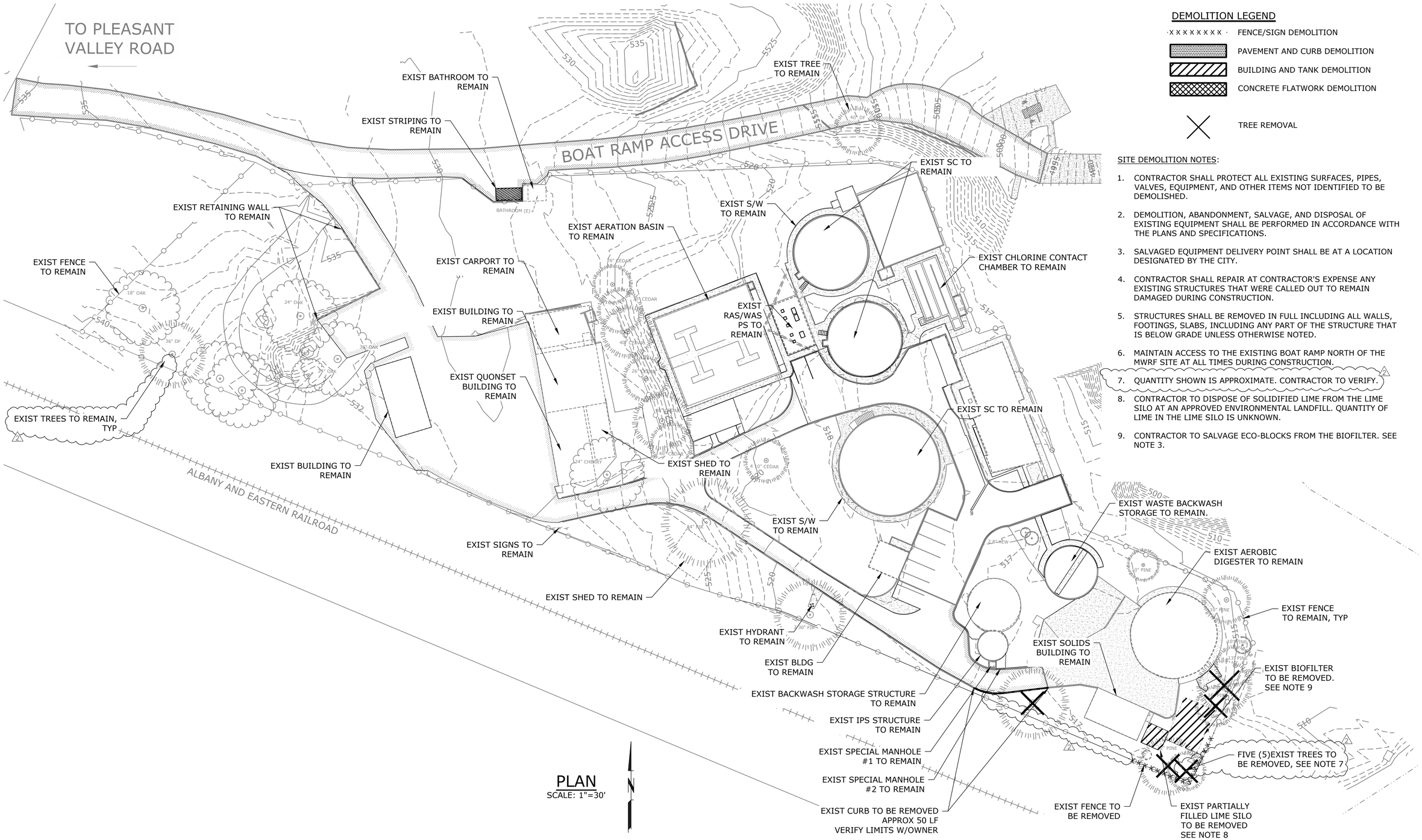
Replace Sheet with the Attached Updated Sheets.

2. Exhibit A:

Add Attached Sheet C-040.

End of Addendum No. 4

	January 18, 2023
Mr. Greg Springman, Public Works Director	Date



PLAN
SCALE: 1"=30'

DEMOLITION LEGEND

- FENCE/SIGN DEMOLITION
- PAVEMENT AND CURB DEMOLITION
- BUILDING AND TANK DEMOLITION
- CONCRETE FLATWORK DEMOLITION
- TREE REMOVAL

SITE DEMOLITION NOTES:

1. CONTRACTOR SHALL PROTECT ALL EXISTING SURFACES, PIPES, VALVES, EQUIPMENT, AND OTHER ITEMS NOT IDENTIFIED TO BE DEMOLISHED.
2. DEMOLITION, ABANDONMENT, SALVAGE, AND DISPOSAL OF EXISTING EQUIPMENT SHALL BE PERFORMED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.
3. SALVAGED EQUIPMENT DELIVERY POINT SHALL BE AT A LOCATION DESIGNATED BY THE CITY.
4. CONTRACTOR SHALL REPAIR AT CONTRACTOR'S EXPENSE ANY EXISTING STRUCTURES THAT WERE CALLED OUT TO REMAIN DAMAGED DURING CONSTRUCTION.
5. STRUCTURES SHALL BE REMOVED IN FULL INCLUDING ALL WALLS, FOOTINGS, SLABS, INCLUDING ANY PART OF THE STRUCTURE THAT IS BELOW GRADE UNLESS OTHERWISE NOTED.
6. MAINTAIN ACCESS TO THE EXISTING BOAT RAMP NORTH OF THE MWRF SITE AT ALL TIMES DURING CONSTRUCTION.
7. QUANTITY SHOWN IS APPROXIMATE. CONTRACTOR TO VERIFY.
8. CONTRACTOR TO DISPOSE OF SOLIDIFIED LIME FROM THE LIME SILO AT AN APPROVED ENVIRONMENTAL LANDFILL. QUANTITY OF LIME IN THE LIME SILO IS UNKNOWN.
9. CONTRACTOR TO SALVAGE ECO-BLOCKS FROM THE BIOFILTER. SEE NOTE 3.

NO.	DATE	BY	REVISION
1	01/09/2023	BVB	ADDENDUM 3
2	01/18/2023	BVB	ADDENDUM 4

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

BVB DESIGNED
BVB DRAWN
WJM CHECKED

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION
JAN 2023
West Yost

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Sweet Home
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MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

SITE DEMOLITION & TREE REMOVAL PLAN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
C-005
XX of XX

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TO PLEASANT VALLEY ROAD

MAIN EXIST ENTRANCE GATE FOR CONSTRUCTION ACCESS

BOAT RAMP ACCESS DRIVE

STAGING AREA

CNT #2 1/2" IR W/RPC
E. 7617008.63'
N. 275599.17'
EL. 529.30'

CNT #8 H/T
E. 7617173.62'
N. 275578.29'
EL. 518.71'

CNT #3 1/2" IR W/RPC
E. 7617283.47'
N. 275542.02'
EL. 518.65'

CNT #9 H/T
E. 7617082.89'
N. 275532.43'
EL. 528.43'

CNT #7 SCRIBE
E. 7617197.42'
N. 275527.31'
EL. 518.13'

CNT #10 SPIKE
E. 7617098.67'
N. 275476.83'
EL. 529.30'

CNT #6 SCRIBE
E. 7617209.55'
N. 275512.15'
EL. 518.57'

CNT #15 CROWS FOOT
E. 7617118.73'
N. 275413.30'
EL. 525.65'

CNT #5 PK NAIL
E. 7616985.95'
N. 275429.18'
EL. 530.92'

CNT #4 PK NAIL
E. 7617275.15'
N. 275401.87'
EL. 518.03'

CNT #11 H/T
E. 7617391.81'
N. 275396.70'
EL. 516.15'

CNT #17 CROWS FOOT
E. 7617393.57'
N. 275385.56'
EL. 515.60'

CNT #12 PK NAIL
E. 7617417.31'
N. 275323.48'
EL. 516.26'

CNT #16
E. 7617461.82'
N. 275292.30'
EL. 516.98'

CNT #13 PK NAIL
E. 7617298.79'
N. 275306.44'
EL. 517.32'

TEMP SCREW PRESS AREA (BY OTHERS)

EXIST SOLIDS BLDG

SLUDGE BLEND TANK SEE SHEET M-250

CNT #14 H/T
E. 7617441.26'
N. 275241.08'
EL. 516.55'

TEMP FENCE

AMES CREEK

ALBANY AND EASTERN RAILROAD

ALBANY AND EASTERN RAILROAD

NOTES:

1. CONTRACTOR TO CONFIRM ALL ACCESS POINTS FOR CONSTRUCTION AND STAGING AREAS WITH OWNER.

Point Table			
Point #	Northing	Easting	Description
1	275245.15	7617456.71	CENTER OF SLUDGE BLEND TANK
2	275285.32	7617487.94	NE CORNER OF TEMP SCREWPRESS AREA
3	275265.75	7617457.65	SW CORNER OF TEMP SCREW PRESS AREA

SITE PLAN LEGEND

- PROPOSED ASPHALT TO BE CONSTRUCTED BY OTHERS
- PROPOSED GRAVEL
- PROPOSED TEMP FENCE
- CONTRACTOR STAGING AREAS

PLAN

SCALE: 1"=30'

NO.	DATE	BY	REVISION
1	01/09/2023	BVB	ADDENDUM 3
2	01/18/2023	BVB	ADDENDUM 4

NOTICE
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BVB DRAWN
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MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

OVERALL SITE PLAN, STRUCTURE COORDINATES, STAGING AND ACCESS, SURVEY CONTROL POINTS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
C-010
XX of XX

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NOTES:

1. CONTRACTOR TO PROTECT ALL EXIST PIPELINES DURING CONSTRUCTION.
2. CONTRACTOR TO INSTALL EROSION CONTROL DEVICES IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT ENTER WATERWAYS, THE STORMWATER SYSTEM, ROADWAYS, ADJACENT PROPERTY OR VIOLATE APPLICABLE WATER QUALITY STANDARDS. WHEN DESIGNING AND IMPLEMENTING MEASURES, THE CONTRACTOR SHALL CONSIDER THE SEASONAL VARIATION OF RAINFALL, TEMPERATURE, AND OTHER CLIMATIC FACTORS RELATIVE TO THE TIMING OF LAND DISTURBANCE ACTIVITIES. SEE DETAILS ON SHEET C-040. INSTALL ADDITIONAL EROSION CONTROL DEVICES SUCH AS CHECK DAMS, TIRE WASH FACILITIES, AS NEEDED TO MEET EROSION CONTROL REQUIREMENTS.
3. INSTALL 6-FOOT-TALL, POST MOUNTED, TEMPORARY CHAIN LINK FENCING WITH 3 STRANDS OF 4-POINT BARBED WIRE, BENT AT 45-DEGREES OUTWARD FROM THE SITE.

STAGING AREA

CONSTRUCTION ENTRANCE SEE 1/C-040

GRAVEL ACCESS SEE 4/C-040, APPROX. 2,000 SF AREA

SEE NOTE 1

13'

EXIST SOLIDS BLDG

EXIST ELEC SEE NOTE 1 (2)

TEMP SD CATCH BASIN UNDER SCREW PRESS (BY OTHERS)

CONVEYOR (BY OTHERS)

6-INCH TEMP SD (BY OTHERS)

6-INCH TEMP PIPING (BY OTHERS)

TEMP PIPING (BY OTHERS) TO BE CONNECTED TO EXIST ABOVE GRADE WAS PIPELINE

EXIST FENCE

SCREW PRESS SKID (BY OTHERS)

EXIST SS SEE NOTE 1 (2)

10"W

TEMP SCREW PRESS AREA (BY OTHERS)

EXIST WL SEE NOTE 1 (2)

SCREW PRESS FEED PUMP IN CLAMSHELL FRP ENCLOSURE (BY OTHERS) (1)

SLUDGE BLEND TANK

SEE SHEET M-250

TEMP CHAIN LINK FENCE SEE NOTE 3 (2)

41'

SITE PLAN LEGEND

- PROPOSED ASPHALT TO BE CONSTRUCTED BY OTHERS
- PROPOSED GRAVEL (2)
- PROPOSED TEMP FENCE

PLAN
SCALE: 1"=10'

NO.	DATE	BY	REVISION
1	01/09/2023	BVB	ADDENDUM 3
2	01/18/2023	BVB	ADDENDUM 4

NOTICE
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West Yost

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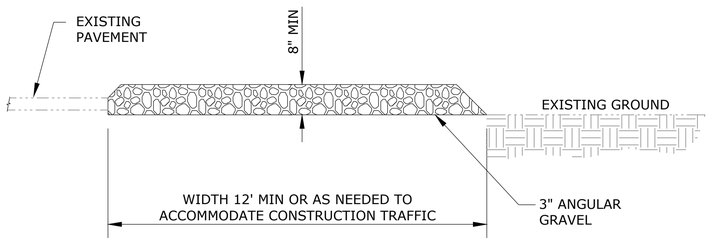
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MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

SOLIDS AREA DETAIL PLAN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

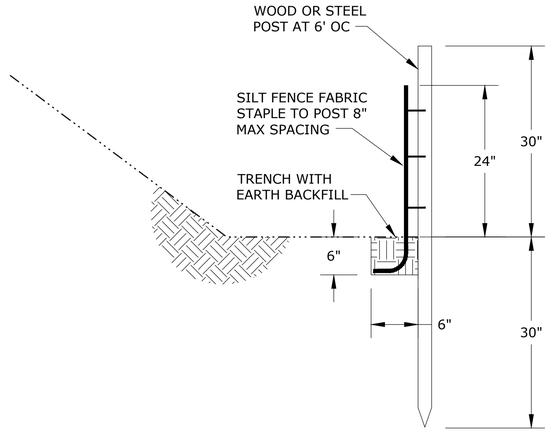
SHEET
C-020
3 of XX



STABILIZED CONSTRUCTION ENTRANCE

SCALE: NTS

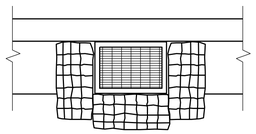
1
-



SILT FENCE

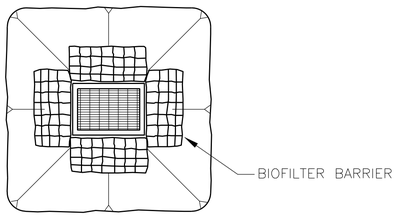
SCALE: NTS

2
-



CURB INLET

NOTES:
1. REMOVE SEDIMENT FROM BEHIND BIOBAGS WHEN IT REACHES 2 INCHES IN DEPTH.
2. INSTALL INLET INSERT SEE 5 -

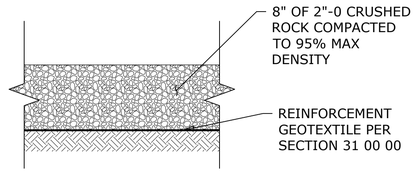


DRAIN INLET

INLET PROTECTION

SCALE: NTS

3
-



GRAVEL SECTION

SCALE: NTS

4
-

NO.	DATE	BY	REVISION
1	01/18/2023	BVB	ADDENDUM 4

NOTICE
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BVB DRAWN
WJM CHECKED

REGISTERED PROFESSIONAL ENGINEER
85993PE
OREGON
NOV. 14, 2014
BROOKE VICTORIA BARRY
EXPIRES : 12/31/2023

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MAHLER WATER RECLAMATION FACILITY
SLUDGE BLEND TANK
DESIGN BUILD

EROSION CONTROL & CIVIL DETAILS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: JANUARY 2023

SHEET
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REQUEST FOR COUNCIL ACTION

Title:	Request for Council Action - Mahler WRF Sludge Blend Tank Design-Build Procurement
Preferred Agenda:	February 14, 2023
Submitted By:	Trish Rice, Engineering Technician Greg Springman, Public Works Director
Reviewed By:	Kelcey Young, City Manager
Type of Action:	Resolution ___ Motion ____ Roll Call _X_ Other ____
Relevant Code/Policy:	N/A
Towards Council Goal:	1.1 Develop specific steps for implementation of the adopted infrastructure master plans.
Attachments:	Procurement documents set

Purpose of this RCA:

Staff requests authorization to procure owner-supplied dewatering equipment through the City's Integrator of Record for the Mahler WRF Improvements Project.

Background/Context:

On November 8, 2022, Council approved the Engineer's recommendation for the Interim Improvements Project including purchase and installation of a new sludge blend tank. The Engineer of Record (West Yost) has prepared the equipment specifications and contract documents.

The procurement was advertised for bid on December 15, 2022 and bids closed on January 24, 2023. We received one bid from Baker Silo, LLC for $1,015,900. This is a design-build contract wherein the vendor will produce the final design of the tank to suit site conditions and will build the tank. There was one exception to the specification regarding the 5-year warranty bond. Staff have negotiated with Baker Silo and tentatively agreed to incorporate Baker Silo's in-house warranty guarantee into the contract documents as an exhibit, rather than requiring the bond, which will enable the warranty guarantee to be legally enforceable.

Staff recommends awarding the procurement contract to Baker Silo and authorizing a 10% contingency controlled by the City Manager bringing the total project budget to $1,117,490. It will be funded by the $7M state earmark.

The Challenge/Problem:

To make efficient use of limited funds to complete needed wastewater treatment improvements and satisfy DEQ requirements and state funding timelines.

Stakeholders:

- *City Residents*. Residents are the customers who deserve good service with the highest return on their taxes and fees that we can provide, and who trust the City to maintain their infrastructure systems at a high level of service.
- *Council Members*. Council members are the voice of the citizens we serve. Each member of this group is interested in providing the best service possible at the lowest possible cost. They must balance leadership with representation.
- *Public Works Department Staff.* This project will greatly improve the operability of the WWTP which is currently undersized and beyond its serviceable lifespan. Staff spends significant time fixing broken down equipment and fighting with system inefficiencies.
- *Management Team*. Comprised of five department heads, each with a responsibility to the citizens and City Manager to run their day-to-day operations as efficiently as possible.
- *Oregon DEQ*. The WWTP upgrade project is required to comply with DEQ regulations.

Issues and Financial Impacts:

We received one bid from Baker Silo, LLC for $1,015,900. Staff also requests a 10% contingency controlled by the City Manager bringing the total project budget to $1,117,490. It will be funded by the $7M state earmark.

Elements of a Stable Solution:

A stable solution will provide efficient completion of needed facility improvements and make full use of the funding from the State of Oregon for this project.

Options:

1. *Option 1 – Move to cancel the project.* Not recommended.
2. *Option 2 – Move to reject all bids and re-bid the project.* Not recommended.
3. *Option 3 – Move to execute the procurement as presented.* Staff will execute the contract and give notice to proceed.

Recommendation:

Staff recommends *Option 3 – Move to execute the procurement as presented.*

REQUEST FOR COUNCIL ACTION

Title:	Request for Council Action - Mahler WRF Dewatering Equipment Procurement
Preferred Agenda:	February 14, 2023
Submitted By:	Trish Rice, Engineering Technician Greg Springman, Public Works Director
Reviewed By:	Kelcey Young, City Manager
Type of Action:	Resolution ___ Motion ____ Roll Call _X_ Other ____
Relevant Code/Policy:	N/A
Towards Council Goal:	1.1 Develop specific steps for implementation of the adopted infrastructure master plans.
Attachments:	TAG quote Mechanical equipment procurement documents set

Purpose of this RCA:

Staff requests authorization to procure owner-supplied dewatering equipment for the Mahler WRF Improvements Project.

Background/Context:

On November 8, 2022, Council approved the Engineer's recommendation for the Interim Improvements Project including purchase and installation of a new solids dewatering screw press and appurtenances. The Engineer of Record (West Yost) has prepared the equipment specifications and contract documents. This request includes two related approvals: awarding a procurement contract for the mechanical equipment, and approving a task order with the City's contracted Integrator of Record for the controls equipment. The equipment from both sources will be installed by a 3rd party contractor in the Interim Improvements Project this spring.

The mechanical equipment procurement was advertised for bid on December 15, 2022 and bids closed on January 10, 2023. We received one bid from FKC Co. Ltd. The original bid was $598,815.00 however it contained several noted exceptions to the specifications. City staff and West Yost reviewed the exceptions and negotiated resolutions with FKC, resulting in a bid amendment for an additional $18,442. Therefore the total bid is $617,257.

The City's contracted Integrator of Record, The Automation Group (TAG), has provided the attached quote totaling $87,664 to provide the control equipment and integration work during installation of the screw press. Most of the control equipment will be produced internally by their panel shop. This is within the scope of the existing Integrator of Record contract and will be a task order therein.

The total for both requests is $704,921. Both approvals are necessary to provide a functional equipment installation.

Staff recommends awarding the mechanical equipment procurement contract to FKC and approving the task order to TAG. It will be funded by the $7M state earmark.

The Challenge/Problem:

To make efficient use of limited funds to complete needed wastewater treatment improvements and satisfy DEQ requirements and state funding timelines.

Stakeholders:

- *City Residents*. Residents are the customers who deserve good service with the highest return on their taxes and fees that we can provide, and who trust the City to maintain their infrastructure systems at a high level of service.
- *Council Members*. Council members are the voice of the citizens we serve. Each member of this group is interested in providing the best service possible at the lowest possible cost. They must balance leadership with representation.
- *Public Works Department Staff.* This project will greatly improve the operability of the WWTP which is currently undersized and beyond its serviceable lifespan. Staff spends significant time fixing broken down equipment and fighting with system inefficiencies.
- *Management Team*. Comprised of five department heads, each with a responsibility to the citizens and City Manager to run their day-to-day operations as efficiently as possible.
- *Oregon DEQ*. The WWTP upgrade project is required to comply with DEQ regulations.

Issues and Financial Impacts:

The original FKC bid for mechanical equipment was $598,815.00 however it contained several noted exceptions to the specifications. City staff and West Yost reviewed the exceptions and negotiated resolutions with FKC, resulting in a bid amendment for an additional $18,442. Therefore the total bid is $617,257.

TAG's quote for providing control equipment and integration is $87,664.

Both approvals are necessary to provide a functional equipment installation. The total for both requests is $704,921. It will be funded by the $7M state earmark and by ARPA.

Elements of a Stable Solution:

A stable solution will provide efficient completion of needed facility improvements and make full use of the funding from the State of Oregon for this project.

Options:

1. *Option 1 – Move to cancel the project.* Not recommended.
2. *Option 2 – Move to reject all bids and re-bid the project.* Not recommended.
3. *Option 3 – Move to execute the FKC contract and the TAG task order as presented.* Staff will execute the FKC contract and give notice to proceed. Staff will execute the TAG task order and give notice to proceed.

Recommendation:

Staff recommends *Option 3 – Move to execute the FKC contract and the TAG task order as presented.*

The Automation Group, Inc.
www.tag-inc.us
CCB #172838
Phone: 541-359-3755

Quote #230128G
Jan. 28, 2023

Trish Rice
City of Sweet Home

RE: Sweet Home WWTP - IIP Screw Press Controls

Project Scope:

TAG is providing a Quote to supply the materials listed below for the Electrical Contractor to install and perform the Tasks listed below. The VFD is specified as the same PF753 that we will be using for the new plant and will be able to be used as a spare.

Materials:

- (1) Radio Enclosure as shown on attached drawings
  - 16x12x8 enclosure
  - Banner Radio (other end shipped loose for Contractor to install in existing Lab area panel)
  - Antenna & cable
  - Lightning arrester
  - Surge suppressor
  - Power supply
  - Terminals, fuses, rail
  - UL508a listing
- (1) Starter Pump Panel
- (1) VFD Pump Panel

Tasks:

- Design with West Yost
- Screw Press Review with West Yost & City
- Drawings for Bid Phase
- Panel Fabrication
- Panel Testing
- Site Programming
  - Radios
  - PLC (Existing & TAG Area in Screw Press PLC)
  - OIT (Are in Screw Press OIT)
  - Dialer
- Onsite construction management of controls installation
- Startup onsite
- Training onsite

Quote

Clarification/Exclusions:

- TAG's Labor Pricing is not affected by the National Supply Chain Shortages, but due to Vendors rapidly increasing material prices, we may need to reprice some materials at time of order.
- Lead Times for specific materials are very unpredictable at this time and cannot be verified until orders are placed. We are also seeing some items slipping from the predicted delivery dates after order by a few weeks and also seeing some items showing up early. TAG will track progress on orders and provide updates.
- Payments with Credit Cards will have additional charges added to the price below based on the current % rate of the processor.

Price……$87,664.00

Thank you,

Gary Jenks

Gary Jenks
(541) 912-3766
gjenks@tag-inc.us

Mahler Water Reclamation Facility (MWRF) Interim Improvements

ADDENDUM NO. 1

FOR

OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

To: All Prospective Bidders

The following clarifications, changes, additions and/or deletions are hereby made a part of the Contract Documents issued for the above referenced project as fully and completely as if the same were fully set forth therein.

This Addendum consists of 285 pages, including this cover page.

CHANGES

The Contract Documents Shall be replaced in their entirety with the attached updated Contract Documents.

End of Addendum No. 1

Mr. Greg Springman, Public Works Director

December 20, 2022
Date

City of Sweet Home
1400 24th Avenue
Sweet Home, OR 97386

Mahler Water Reclamation Facility (MWRF) Interim Improvements

Owner-Provided Dewatering Equipment Procurement Bid Documents

Document for the Provision of
Goods and Special Services

December 2022

WEST YOST
Water. Engineered.

5 Centerpointe Dr #130,
Lake Oswego, OR 97035
(530) 756-5905
FAX (530) 756-5991

MWRF Owner-Provided Dewatering Equipment Procurement
Table of Contents

BIDDING REQUIREMENTS

EJCDC C-111	Advertisement for Bidders
EJCDC C-200	Instruction to Bidders
00 40 00	Bid Form
EJCDC C-430	Bid Bond (Penal Sum Form)
00 43 33	Proposed Products List
00 45 19	Non-Collusion Affidavit

CONTRACT FORMS

EJCDC P-520	Agreement between Buyer and Seller for Procurement Task Order
EJCDC P-610	Performance Bond for Procurement Task Order
EJCDC P-615	Payment Bond for Procurement Task Order
EJCDC P-625	Buyer's Acknowledgment of Receipt of Goods

CONDITIONS OF THE CONTRACT

EJCDC P-700	Standard General Conditions of the Procurement Task Order

TECHNICAL SPECIFICATIONS

Division 01 – General Requirements

01 33 00	Submittals
01 61 10	Seismic Design Requirements
01 61 11	Seismic Anchorage and Bracing
01 61 50	Wind Design Criteria
01 66 00	Materials and Equipment
01 78 23	Operations and Maintenance Data
01 79 00	Training
01 81 00	Equipment Startup and Testing
01 99 00	Reference Forms

Division 05 – Metals

05 50 01	Anchor Bolts and Anchoring Devices

Division 09 – Finish

09 96 00	High Performance Coatings

Division 11 – Equipment

11 05 13	Electric Motors

Division 40– Process Interconnections

40 61 96.13	Process Control Descriptions
40 78 00	Panel Mounted Equipment

Division 41– Material Processing and Handling Equipment

41 12 13	Shaftless Screw Conveyors

Division 46 – Water and Wastewater Equipment

46 05 13	General Requirements for Equipment
46 05 14	Equipment Mounting
46 33 33	Polymer Blending Unit
46 76 27	Screw Press Dewatering Equipment

EXHIBIT A: Drawings

G-000	Cover Sheet, Vicinity and Location Maps
C-010	Overall Site Plan, Structure Coordinates, Staging and Access, Survey Control Points
C-020	Solids Area Detail Plan
I-001	Legend, Symbols and Abbreviations 1
I-002	Legend, Symbols and Abbreviations 2
I-251	Solids Dewatering P&ID
I-252	Solids Dewatering P&ID 2
I-253	Polymer Makedown P&ID

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ADVERTISEMENT FOR BIDS

CITY OF SWEET HOME, OREGON
MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

General Notice

City of Sweet Home (Owner) is requesting Bids for the construction of the following Project:

MAHLER WATER RECLAMATION FACILITY
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

Bids for the construction of the Project will be received at Sweet Home City Hall located at 3225 Main Street, Sweet Home, OR 97386, until **January 10, 2023** at **2:00 pm** local time. At that time the Bids received will be publicly opened and read.

The Project includes the following Work:

Improvements and modifications to the City of Sweet Home Mahler Water Reclamation Facility (Mahler WRF) includes furnishing all labor, materials, and equipment necessary for the procurement of new dewatering screw press, conveyor, polymer blending unit and associated appurtenances.

Obtaining the Bidding Documents

The Contract Documents may be examined at Sweet Home City Hall. Electronic copies of the Contract Documents will be provided by the Owner. Hard copies of the Contract Documents will be provided to the successful Bidder following Bid Award.

Instructions to Bidders

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders included in the Bidding Documents.

American Iron and Steel

Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference applies an American Iron and Steel requirement to this project. All iron and steel products used in this project must be produced in the United States. The term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials.

The following waivers apply to this Contract:

1. De Minimis,
2. Minor Components, and
3. Pig iron and direct reduced iron.

This Advertisement is issued by:

Owner: **City of Sweet Home, Oregon**
By: **Greg Springman**
Title: **Public Works Director**
Date: **December 15, 2022**

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INSTRUCTIONS TO BIDDERS FOR PROCUREMENT CONTRACT

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ARTICLE 1—DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.04 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective Bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

2.06 *Electronic Documents*

A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of

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the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.

1. Electronic Documents that are available in native file format include:

a. Electronic Drawing files in Revit, AutoCAD MEP and AutoCAD Civil3D.

b. Digital Elevation Model (DEM) for the construction site

2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.

3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.

4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—RESERVED

ARTICLE 4—RESERVED

ARTICLE 5—SITE AND OTHER AREAS OWNER'S SAFETY PROGRAM

5.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

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5.02 *Owner's Safety Program*

A. Site visits and work at the Site is governed by Oregon OSHA requirements.

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Owner and Engineer in writing.

7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of 5% percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 5.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents. Bid security must be at least 5% of the Bidder's maximum price.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

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8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 91 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.

9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items.

10.02 All prices that Bidder sets forth in its Bid will be based on the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda.

ARTICLE 11—RESERVED

ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

C. Bidders shall provide pricing for all "A-listed" or first-named equipment suppliers in the Bid Form.

12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

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12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 All names must be printed in ink below the signatures.

12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

A. Bidders must submit a Bid on a lump sum basis for each bid item as set forth in the Bid Form.

13.02 *Additive and Deductive Unit Price Work Bid Items*

A. Bidders must submit unit prices for bid items with additional work beyond the quantities included in the Lump Sum Bid.

1. Additive and Deductive Unit Price Work Items shall include:

a. None

B. Costs for Additive and Deductive Unit Price Work Bid Items will be considered by the Owner in the evaluation of bids based on the potential impact of increased or decreased quantities for these Bid items in the course of executing the Work.

C. Bidders shall not unbalance bids for Additive and Deductive Unit Price Work Items.

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13.03 *Allowances*

A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 14—SUBMITTAL OF BID

14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, the name and address of Bidder, the date of opening, the applicable words "SEALED BID" and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED" A mailed Bid must be addressed to the location designated in the Advertisement.

14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

14.04 All responses submitted are the property of the City of Sweet Home, thus subject to disclosure pursuant to Oregon Public Records law, as qualified by ORS 279B.060(6) for similar contracts. Except for information marked "Proprietary", all documents received by City shall be available for public disclosure. The City will attempt to maintain the confidentiality of materials marked "Proprietary" to the extent permitted under the Oregon Public Records law. By responding to this solicitation, Bidders waive any challenge to the City's decisions in this regard.

14.05 **Marking all, or substantially all, or your response as "Proprietary" is not permitted and may be grounds for the City considering your bid nonresponsive, at the City's sole discretion.** If your response contains proprietary information protected under this section, please provide an additional redacted copy.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid,

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and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16—OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. For determination of the apparent lowest responsive and responsible Bidder, Bids will be compared on the basis of the Lump Sum Price along with potential additional costs for Additive or Deductive Additional Work Bid Items determined at the Owner's discretion.

18.06 *Protests of Solicitation*

A. Bidders are directed to the protest procedures contained in ORS 279B.405 and OAR 137-047-0730. A prospective Bidder may file a protest of the solicitation if the prospective Bidder believes that the procurement process is contrary to law or that a solicitation document is unnecessarily restrictive, is legally flawed or improperly specifies a brand name. Protests shall be submitted to the City in writing no later than ten (10) days prior to the solicitation closing date.

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18.07 *Protests of Contract Award*

A. Bidders are directed to the protest procedures contained in ORS 279B.410 and OAR 137-047-0740. A Bidder may protest the award of a public contract or a notice of intent to award a public contract, whichever occurs first, if:

1. The bidder is adversely affected because the bidder would be eligible to be awarded the public contract in the event that the protest were successful; and

2. The reason for the protest is that:

a. All lower bids or higher ranked proposals are nonresponsive;

b. The contracting agency has failed to conduct the evaluation of proposals in accordance with the criteria or processes described in the solicitation materials;

c. The contracting agency has abused its discretion in rejecting the protestor's bid or proposal as nonresponsive; or

d. The contracting agency's evaluation of bids or proposals or the contracting agency's subsequent determination of award is otherwise in violation of this chapter or ORS chapter 279A.

B. Protests shall be submitted to the City in writing no later than seven (7) days following the notice of intent to award.

ARTICLE 19—BONDS AND INSURANCE

19.01 Article 5 of the General Conditions sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.

19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

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ARTICLE 21— PREVAILING WAGES

21.01 The Contractor shall abide by ORS 279c.800 through 279c.870 which relate to the prevailing wage rates for the building and construction trades in the state of Oregon. These prevailing wage rates are shown in the published Oregon Bureau of Labor and Industries (BOLI) documentation, which is described in these Contract Documents. Federal Davis-Bacon act requirements also apply, as executed by the United States Department of Labor (DOL). The higher of the two wages shall be paid to all workers as applicable on this project. The Contractor shall be aware of the requirements described elsewhere in these Contract Documents. Both items are referenced and described in the Oregon DEQ form "Prevailing Wage Agreement" included in these Contract Documents, which is a form that is required to be completed by the Contractor and submitted at the time of bid placement.

21.02 Bidders are advised to examine and to be thoroughly familiar with such requirements. No claim for additional compensation will be allowed that is based upon a lack of knowledge of these requirements or a failure to include adequate increases in such wages over the term of this Contract in the Bidder's bid price.

ARTICLE 22— PREVAILING WAGE RATE FORMS

22.01 Before payment is made by the Owner of any sums due under this Contract, the Owner must receive from the Contractor and each subcontractor or agent a copy of all required BOLI & DOL forms and Weekly Certified Payrolls from the Contractor and each subcontractor or agent.

22.02 Upon completion of this contract, the Owner must receive from the Contractor and each subcontractor a copy of all required BOLI and DOL forms for project closeout.

22.03 These forms and any required affidavits will be required before any funds retained are released to the Contractor. Forms may be obtained from BOLI and DOL. In some cases fees are required to accompany forms submitted. The Contractor is responsible for payment of these fees and shall make all applications directly to BOLI/DOL. These fees shall be incidental to all bid items of this Contract.

ARTICLE 23—NONDISCRIMINATION

23.01 During the performance of this contract, the Contractor shall comply with all federal and state nondiscrimination laws, including, but not limited to 42 U.S.C. 12101 et seq, the Americans with Disabilities Act (ADA).

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SECTION 00 40 00 - BID FORM

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON

THIS BID IS SUBMITTED TO: City of Sweet Home

Attn: Greg Springman, Public Works Director
3225 Main Street
Sweet Home, OR 97386

1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2.01 Bidder accepts all of the terms and conditions of the Advertisement for Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.

2.02 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 13.05 of the General Conditions on or before the **dates or within the number of calendar days indicated in the Agreement.**

2.03 Bidder agrees to complete the Work required to complete the Milestones in accordance with Article 2 of the Agreement by the dates provided in Article 2.02.

2.04 Bidder accepts the provisions of the Agreement as to liquidated damages as stipulated in Article 2.04 of the Agreement and in the General Conditions.

3.01 Refer to the Instructions to Bidders for forms and documents that must be executed in full and submitted with the bid.

3.02 The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, and the General Conditions.

3.03 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data and documents identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

Addendum No.	**Addendum Date**

B. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

C. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

D. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.

E. Bidder has correlated the information known to Bidder, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

F. Bidder has given OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by OWNER is acceptable to Bidder.

G. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.01 Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the price described in the following bid schedule within the time of completion specified in the Agreement.

BID SCHEDULE

Bidder shall submit a Bid as set forth in the Bid form. Submission of Bids on this schedule signifies Bidder's willingness to enter into a Contract for the price offered. Bidders offering a Bid on this schedule must be capable of completing the Work within the time period stated in the Agreement. OWNER may elect to any delete bid item from the work.

1.01 LUMP SUM WORK

A. Bidder proposes and agrees to accept as full payment the following bid amount for the Mahler WRF Owner-Provided Dewatering Equipment Procurement proposed within the Bidding Documents, and certifies that this amount is based upon the undersigned's own estimate of quantities and costs and includes sales, consumer, use, and other taxes, except as provided below, overhead and profit.

B. Lump Sum Bid Price: $_____

Bidder Identification and Signatures

Name of Firm: _____

Federal Tax ID No: _____

State of Incorporation and Oregon CCB License No: _____

Bidder ☐ IS / ☐ IS NOT a "Resident Bidder" as defined by ORS 279.029.

Signature and Printed Name(s): *(If Bidder is a partnership or joint venture, all parties must sign below)*

_____ _____

_____ _____

Title _____

Date _____

END OF SECTION

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ARTICLE 1— BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name:	Name:
Address *(principal place of business)*:	Address *(principal place of business)*:
Owner	**Bid**
Name: City of Sweet Home, Oregon	Project *(name and location)*:
Address *(principal place of business)*:	Mahler WRF Owner-Provided Dewatering Equipment Procurement 1357 Pleasant Valley Road Sweet Home, OR 97386
3225 Main Street Sweet Home, OR 97386	Bid Due Date: January 10, 2023
Bond	
Penal Sum:	
Date of Bond:	

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	Surety
_____	_____
(Full formal name of Bidder)	*(Full formal name of Surety) (corporate seal)*
By: _____	By: _____
(Signature)	*(Signature) (Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title:	Title:

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

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1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
    3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
    3.2. All Bids are rejected by Owner, or
    3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

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SECTION 00 43 33- PROPOSED PRODUCTS LIST

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON

The Bidder states that the manufacturer of each listed item of equipment or material proposed by the Contractor for use on this Project will be as listed below:

Material Item	Description	Equipment or Material Manufacturer (Do not show Dealer or Supplier)
1	Screw Press Dewatering Equipment (46 76 27)	
2	Shaftless Screw Conveyors (41 12 13)	
3	Polymer Blending Unit (46 33 33)	

The Bidder must include in the space provided, the name of the equipment or material manufacturer he has used in determining his Base Bid which will be used by the Successful Bidder in constructing the project. If the Bidder does not fill in any of the spaces, it will be considered that the Bidder has selected the first-named manufacturer as his selection for those spaces not filled in.

After the opening of Bids, no changes or substitutions from those listed manufacturers will be allowed without the express written approval of the Engineer. If such change is permitted by the Engineer, it will be evaluated in accordance with provisions of the Contract Documents pertaining to Specified Items/Proposed Equivalents.

Circumstances which will justify changes to the above listing are limited to the following:

1. Manufacturer is unable to meet specifications.
2. Manufacturer fails to honor original quotation upon which the Contractor's bid was based.
3. Manufacturer goes out of business or ceases to make the specified product.

It is the responsibility of the Contractor to furnish materials and equipment meeting the requirements of the Specifications, and acceptance of the bid does not constitute nor imply favorable review or approval of items proposed. The Owner reserves the right to deny approval or acceptance of any equipment or materials which do not comply with Specifications even though listed herein.

_____
(Signature)

_____
(Type or Print Name)

_____
(Title)

_____
(Company)

END OF SECTION

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SECTION 00 45 19 – NON-COLLUSION AFFIDAVIT

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON

STATE OF OREGON
COUNTY OF LINN

I state that I am_____(title) of_____(name of firm) and that I am authorized to make this affidavit on behalf of my firm and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder, except as disclosed on the attached appendix.

(2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

(5) _____(name of firm), its affiliates, subsidiaries, officers, directors and employees are not currently under investigation by any governmental agency for violating any non-collusion statutes and have not in the last four years been convicted of or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described in the attached appendix.

I state that_____(name of firm) understands and acknowledges that the above representations are material and important and will be relied on by the City of Sweet Home in awarding the contract(s) for which this bid is submitted. I understand, and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the City of Sweet Home of the true facts relating to the submission of bids for this contract.

_____
Authorized Signature

_____
Name of Company / Position

Sworn to and subscribed before me this_____day of_____, 20____.

_____ _____
Notary Public for the State of Oregon My Commission Expires

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P520 – AGREEMENT BETWEEN BUYER AND SELLER FOR PROCUREMENT TASK ORDER

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P520 – AGREEMENT BETWEEN BUYER AND SELLER FOR PROCUREMENT TASK ORDER

This Procurement Agreement is by and between **the City of Sweet Home** ("Buyer") and _____("Seller") for the Mahler Water Reclamation Facility (MWRF) Owner-Provided Dewatering Equipment Procurement.

Terms used in this Procurement Agreement have the meanings stated in the General Conditions of the Procurement Task Order and the Supplementary Conditions of the Procurement Task Order.

Buyer and Seller hereby agree as follows:

ARTICLE 1—PROCUREMENT TASK ORDER

1.01 *Goods and Special Services*

A. Seller shall furnish the Goods and Special Services as specified or indicated in the Procurement Task Order Documents. The Goods and Special Services are generally described as follows:

1. **Goods and Special Services:** Provision of dewatering equipment including:

a. MWRF Dewatering Screwpress

b. MWRF Polymer Blending Unit

c. MWRF Shaftless Screw Conveyor

1.02 *The Project*

A. The Project, of which the Goods and Special Services are a part, is generally described as follows: **Mahler Water Reclamation Facility Interim Improvements Project (Project).**

1.03 *Engineer*

A. Buyer has retained **West Yost Associates, Inc.** ("Engineer"), to prepare Procurement Task Order Documents and act as Buyer's representative. Engineer assumes all duties and responsibilities and has the rights and authority assigned to Engineer in the Procurement Task Order Documents in connection with Seller's furnishing of Goods and Special Services.

1.04 *Point of Destination*

The Point of Destination is designated as: **Mahler Water Reclamation Facility, 1357 Pleasant Valley Road, Sweet Home, OR 97386.**

ARTICLE 2—PROCUREMENT TASK ORDER TIMES

2.01 *Time of the Essence*

A. All time limits for Milestones, including the submittal of Shop Drawings and Samples, the delivery of Goods, and the furnishing of Special Services as stated in the Procurement Task Order Documents, are of the essence of the Procurement Task Order.

2.02 *Schedule of Procurement Task Order Times*

A. The following schedule sets forth the Procurement Task Order Times:

Milestone	Date or Days	Notes
Seller to provide MWRF Dewatering Equipment Submittals and Shop Drawings	**February 9, 2023**	
Freight on Board (FOB) delivery of Goods to Point of Destination	**April 27, 2023**	
Final Completion	**June 16, 2023**	

2.03 *Shop Drawings and Samples*

A. *Submittal of Shop Drawings and Samples*: Seller shall base procurement of dewatering equipment on MWRF Owner-Provided Dewatering Equipment Procurement final Task Order documents dated January 2023.

B. *Engineer's Review*: It is the intent of the parties that provision of Goods and Special Services under this Procurement Task Order will be based on the MWRF Owner-Provided Dewatering Equipment Procurement final Task Order documents dated January 2023 issued by the Engineer.

2.04 *Liquidated Damages*

A. Buyer and Seller recognize that time is of the essence as stated in Paragraph 2.01, and that Buyer will suffer financial and other losses if the Goods are not delivered to the Point of Destination and ready for receipt of delivery by Buyer within the time specified in Paragraph 2.02, plus any extensions thereof allowed in accordance with this Procurement Task Order. The parties also recognize that the timely performance of services by others involved in the Project is materially dependent upon Seller's specific compliance with the delivery requirements of Paragraph 2.02. Further, the parties recognize the time, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the loss (whether direct, consequential, or otherwise) suffered by Buyer if complete, acceptable Goods are not delivered on time. Accordingly, instead of requiring any such proof, Buyer and Seller agree that as liquidated damages for delay (but not as a penalty) Seller shall pay Buyer $200 for each Day that expires after the time specified in Paragraph 2.02 for Delivery of Goods to the Point of Destination following approval of Submittals and Shop Drawings.

ARTICLE 3—PROCUREMENT TASK ORDER PRICE

3.01 *Procurement Task Order Price and Total Price*

A. The Procurement Task Order Price is comprised of the Lump Sum amount set forth in the following paragraphs.

B. Buyer shall pay Seller a Lump Sum of **$_____(_____dollars)** for furnishing the Goods and Special Services (other than any Unit Price Goods and Special Services) in accordance with the Procurement Task Order Documents.

3.02 *Procurement Task Order Price and Total Price—Based on Attached Bid*

A. For furnishing the Goods and Special Services in accordance with the Procurement Task Order Documents, Buyer shall pay Seller the prices stated in Seller's Bid, subject to final adjustments for Unit Price Goods and Special Services and Buyer's Contingency Allowance, if any, and subject to the following Buyer-accepted alternates: **No alternates.**

ARTICLE 4—PAYMENT PROCEDURES

4.01 *Submittal and Processing of Applications for Payment*

A. Seller shall submit Applications for Payment in accordance with Article 13 of the General Conditions and the following paragraphs. Engineer and Buyer will process such Applications for Payment in accordance with said Article 13.

4.02 *Progress Payments; Final Payment*

A. **Payment Schedule 1 for Goods:** Seller may submit an Application for Payment requesting the stated percentage of Procurement Task Order Price for the Dewatering Screwpress based upon the following Payment Line Items:

Payment Line Item (Lump Sum)	Percentage of Lump Sum
1. Engineer's Approval of Submittals and Shop Drawings	10
2. Freight on Board (FOB) delivery of Goods to Point of Destination along with provision of final Operations and Maintenance manuals, submittal of warranties and other final documentation required by the Procurement Task Order Documents.	80
3. Final Completion	10
Total Procurement Task Order Price for Goods (Lump Sum)	**100**

B. Buyer shall pay Seller the amount owed under an Application for Payment within 30 days after Engineer's presentation to Buyer of the Application for Payment and Engineer's recommendation.

4.03 *Interest*

A. All amounts not paid when due will bear interest as the rate of 6 percent per annum.

ARTICLE 5—RESERVED

ARTICLE 6—PROCUREMENT TASK ORDER DOCUMENTS

6.01 *List of Procurement Task Order Documents*

A. The Procurement Task Order Documents consist of the following:

1. This Procurement Agreement.
2. General Conditions of the Procurement Task Order.

3. Bonds:
    a. Performance bond (together with power of attorney).
    b. Payment bond (together with power of attorney).
4. Exhibits to this Procurement Agreement (enumerated as follows):
    a. Drawings:
        1) G-000: Cover Sheet, Vicinity and Location Maps
        2) C-010: Overall Site Plan and Staging Areas Plan
        3) C-020: Solids Area Detail Plan
        4) I-001: Legend, Symbols and Abbreviations 1
        5) I-002: Legend, Symbols and Abbreviations 2
        6) I-251: Solids Dewatering P&ID
        7) I-252: Solids Dewatering P&ID 2
        8) I-253: Polymer Makedown P&ID
    b. Technical Specifications
5. The following which may be delivered or issued on or after the Effective Date of the Procurement Task Order and are not attached hereto:
    a. Change Orders;
    b. Change Directives; and
    c. Field Orders.

B. The documents listed in Paragraph 6.01.A are attached to this Procurement Agreement (except as expressly noted otherwise above).

C. There are no Procurement Task Order Documents other than those listed above.

D. The Procurement Task Order Documents may only be amended or supplemented as provided in Paragraph 11.01 of the Procurement General Conditions.

ARTICLE 7—SELLER'S REPRESENTATIONS AND CERTIFICATIONS

7.01 *Seller's Representations*

A. In order to induce Buyer to enter into this Procurement Agreement, Seller makes the following representations:

1. Seller has examined and carefully studied the Procurement Task Order Documents.

2. If required by the Instructions to Bidders to visit the Point of Destination and the site where the Goods are to be installed or Special Services will be provided, or if, in Seller's judgment, any observable local or site conditions may affect the delivery, cost, progress, or furnishing of the Goods and Special Services, then Seller has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided (as applicable) and become familiar with and is satisfied as to the observable

local and site conditions that may affect delivery, cost, progress, and furnishing of the Goods and Special Services.

3. Seller is familiar with and is satisfied as to all Laws and Regulations that may affect the cost, progress, and performance of Seller's obligations under the Procurement Task Order.

4. Seller has carefully studied, considered, and correlated the information known to Seller with respect to the effect of such information on the cost, progress, and performance of Seller's obligations under the Procurement Task Order.

5. Seller has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Seller has discovered in the Procurement Task Order Documents, and the written resolution (if any) thereof by Engineer is acceptable to Seller.

6. The Procurement Task Order Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance of Seller's obligations under the Procurement Task Order.

7. Seller's entry into this Procurement Task Order constitutes an incontrovertible representation by Seller that without exception all prices in the Procurement Agreement are premised upon furnishing the Goods and Special Services as required by the Procurement Task Order Documents.

7.02 *Seller's Certifications*

A. Seller certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Procurement Task Order. For the purposes of this Paragraph 7.02:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Procurement Task Order execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Procurement Task Order to the detriment of Buyer, (b) to establish bid or Task Order prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Procurement Task Order.

ARTICLE 8—RESERVED

ARTICLE 9—MUTUAL WAIVER

9.01 *Mutual Waiver of Consequential Damages*

A. Buyer and Seller waive against each other, and against the other's officers, directors, members, partners, employees, agents, consultants, and subcontractors, any and all claims for or entitlement to incidental, indirect, or consequential damages arising out of, resulting from, or related to the Procurement Task Order. If Buyer (Project Owner) assigns this Procurement Task Order to a construction contractor (Contractor/Assignee), then the terms of this Paragraph 9.01.A will be binding upon the Contractor/Assignee with respect to Seller and assignor. The terms of this mutual waiver do not apply to or limit any claim by either Buyer or Seller against the other based on any of the following: (a) contribution or indemnification, (b) liquidated damages, (c) costs, losses, or damages attributable to personal or bodily injury, sickness, disease, or death, or to injury to or destruction of the tangible property of others, (d) intentional or reckless wrongful conduct, or (e) rights conferred by any bond provided by Seller under this Procurement Task Order.

IN WITNESS WHEREOF, Buyer and Seller have signed this Procurement Agreement. Counterparts have been delivered to Buyer and Seller.

The Effective Date of the Procurement Task Order is _____.

Buyer	Seller
_____	_____
(typed or printed name of organization)	*(typed or printed name of organization)*
By: _____	By: _____
(individual's signature)	*(individual's signature)*
Date: _____	Date: _____
(date signed)	*(date signed)*
Name: _____	Name: _____
(typed or printed)	*(typed or printed)*
Title: _____	Title: _____
(typed or printed)	*(typed or printed)*
	(If Seller is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
Attest: _____	Attest: _____
(individual's signature)	*(individual's signature)*
Title: _____	Title: _____
(typed or printed)	*(typed or printed)*
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
_____	_____
Designated Representative:	Designated Representative:
Name: _____	Name: _____
(typed or printed)	*(typed or printed)*
Title: _____	Title: _____
(typed or printed)	*(typed or printed)*
Address:	Address:
_____	_____
_____	_____
_____	_____
Phone: _____	Phone: _____
Email: _____	Email: _____
(If Buyer is a corporation, attach evidence of authority to sign. If Buyer is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)	

P610 – PERFORMANCE BOND FOR PROCUREMENT TASK ORDER

Seller Name: Address *(principal place of business)*:	**Surety** Name: Address *(principal place of business)*:
Buyer Name: **City of Sweet Home** Mailing address *(principal place of business)*: **1400 24th Ave** **Sweet Home, OR 97386**	**Procurement Contract** **Description *(name and location)*:** furnishing dewatering equipment **Project:** Mahler WRF Interim Improvements Project – Owner Provided Dewatering Equipment Procurement **Point of Destination:** 1357 Pleasant Valley Road, Sweet Home, OR 97386 **Procurement Contract Price:** $ **Effective Date of Procurement Contract:**

Bond

Bond Amount: **$**

Date of Bond:

(Date of Bond cannot be earlier than Effective Date of Procurement Contract)

Modifications to this Bond form:

☒ None ☐ See Paragraph 15

Surety and Seller, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

Seller as Principal	Surety
(Full formal name of Seller)	*(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Seller, Surety, Buyer, or other party is considered plural where applicable.

1. The Seller and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Buyer for the performance of the Procurement Task Order, which is incorporated herein by reference.

2. If the Seller performs the Procurement Task Order, the Surety and the Seller shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Buyer Default under the Procurement Task Order, the Surety's obligation under this Bond will arise after:

    3.1. The Buyer first provides notice to the Seller and the Surety that the Buyer is considering declaring a Seller Default. Such notice may indicate whether the Buyer is requesting a conference among the Buyer, Seller, and Surety to discuss the Seller's performance. If the Buyer does not request a conference, the Surety may, within five (5) business days after receipt of the Buyer's notice, request such a conference. If the Surety timely requests a conference, the Buyer shall attend. Unless the Buyer agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Buyer's notice. If the Buyer, the Seller, and the Surety agree, the Seller shall be allowed a reasonable time to perform the Procurement Task Order, but such an agreement does not waive the Buyer's right, if any, subsequently to declare a Seller Default;

    3.2. The Buyer declares a Seller Default, terminates the Procurement Task Order, and notifies the Surety; and

    3.3. The Buyer has agreed to pay the Balance of the Procurement Task Order Price in accordance with the terms of the Procurement Task Order to the Surety or to a seller selected to perform the Procurement Task Order.

4. Failure on the part of the Buyer to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Buyer has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

    5.1. Arrange for the Seller, with the consent of the Buyer, to perform and complete the Procurement Task Order;

    5.2. Undertake to perform and complete the Procurement Task Order itself, through its agents or independent contractors;

    5.3. Obtain bids or negotiated proposals from qualified sellers acceptable to the Buyer for a Task Order for performance and completion of the Procurement Task Order, arrange for a Task Order to be prepared for execution by the Buyer and a seller selected with the Buyer's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Procurement Task Order, and pay to the Buyer the amount of damages as described in Paragraph 7 in excess of the Balance of the Procurement Task Order Price incurred by the Buyer as a result of the Seller Default; or

    5.4. Waive its right to perform and complete, arrange for completion, or obtain a new seller, and with reasonable promptness under the circumstances:

        5.4.1. After investigation, determine the amount for which Surety may be liable to the Buyer and, as soon as practicable after the amount is determined, make payment to the Buyer; or

5.4.2. Deny liability in whole or in part and notify the Buyer, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven (7) days after receipt of an additional written notice from the Buyer to the Surety demanding that the Surety perform its obligations under this Bond, and the Buyer shall be entitled to enforce any remedy available to the Buyer. If the Surety proceeds as provided in Paragraph 5.4, and the Buyer refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Buyer shall be entitled to enforce any remedy available to the Buyer.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Buyer will not be greater than those of the Seller under the Procurement Task Order, and the responsibilities of the Buyer to the Surety will not be greater than those of the Buyer under the Procurement Task Order. Subject to the commitment by the Buyer to pay the Balance of the Procurement Task Order Price, the Surety is obligated, without duplication for:

   7.1. the responsibilities of the Seller for correction of defective or non-conforming Goods and Special Services, and completion of the Procurement Task Order;

   7.2. additional legal, design professional, and delay costs resulting from the Seller's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

   7.3. liquidated damages, or if no liquidated damages are specified in the Procurement Task Order, actual damages caused by delayed performance or non-performance of the Seller.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Buyer or others for obligations of the Seller that are unrelated to the Procurement Task Order, and the Balance of the Procurement Task Order Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Buyer or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Procurement Task Order or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction where the Point of Destination is located and must be instituted within two years after a declaration of Seller Default, or within two years after the Seller ceased working, or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Buyer, or the Seller must be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Point of Destination, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

    14.1. *Balance of the Procurement Task Order Price*—The total amount payable by the Buyer to the Seller under the Procurement Task Order after all proper adjustments have been made including allowance for the Seller for any amounts received or to be received by the Buyer in settlement of insurance or other claims for damages to which the Seller is entitled, reduced by all valid and proper payments made to or on behalf of the Seller under the Procurement Task Order.

    14.2. *Buyer Default*—Failure of the Buyer, which has not been remedied or waived, to pay the Seller as required under the Procurement Task Order or to perform and complete or comply with the other material terms of the Procurement Task Order.

    14.3. *Goods and Special Services*—The full scope of materials, equipment, other items, and services to be furnished by Seller, as defined in the Procurement Task Order.

    14.4. *Point of Destination*—The location where delivery of the Goods shall be made, as stated in the Procurement Task Order.

    14.5. *Procurement Task Order*—The contractual agreement between the Buyer and Seller identified on the cover page, including all Procurement Task Order Documents and changes made to the Procurement Contract.

    14.6. *Seller Default*—Failure of the Seller, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Procurement Task Order.

    14.7. *Procurement Task Order Documents*—All the documents that comprise the contractual agreement between the Buyer and Seller.

15. Modifications to this Bond are as follows: **None**

P615 – PAYMENT BOND FOR PROCUREMENT TASK ORDER

Seller Name: Address *(principal place of business)*:	**Surety** Name: Address *(principal place of business)*:
Buyer Name: **City of Sweet Home** Mailing address *(principal place of business)*: **1400 24th Ave** **Sweet Home, OR 97386**	**Procurement Task Order** **Description *(name and location)*:** furnishing dewatering equipment **Project:** Mahler WRF Interim Improvements Project – Owner Provided Dewatering Equipment Procurement **Point of Destination:** 1357 Pleasant Valley Road, Sweet Home, OR 97386 **Procurement Task Order Price:** $ **Effective Date of Procurement**

Bond

Bond Amount: **$**

Date of Bond:

(Date of Bond cannot be earlier than Effective Date of Procurement Task Order)

Modifications to this Bond form:

☐ None ☐ See Paragraph 17

Surety and Seller, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

Seller as Principal	Surety
(Full formal name of Seller)	*(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Seller, Surety, Buyer, or other party is considered plural where applicable.

1. The Seller and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Buyer to pay for labor, materials, and equipment furnished for use in the performance of the Procurement Task Order, which is incorporated herein by reference, subject to the following terms.

2. If the Seller promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Buyer from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Procurement Task Order, then the Surety and the Seller shall have no obligation under this Bond.

3. If there is no Buyer Default under the Procurement Task Order, the Surety's obligation to the Buyer under this Bond will arise after the Buyer has promptly notified the Seller and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Buyer or the Buyer's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Procurement Task Order, and tendered defense of such claims, demands, liens, or suits to the Seller and the Surety.

4. When the Buyer has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Buyer against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond will arise after the following:

    5.1. Claimants who do not have a direct Task Order with the Seller

        5.1.1. have furnished a written notice of non-payment to the Seller, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

        5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).

    5.2. Claimants who are employed by or have a direct Task Order with the Seller have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Buyer to the Seller, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

    7.1. Send an answer to the Claimant, with a copy to the Buyer, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

    7.2. Pay or arrange for payment of any undisputed amounts.

    7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Seller may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Buyer to the Seller under the Procurement Task Order will be used for the performance of the Procurement Task Order and to satisfy claims, if any, under any procurement performance bond. By the Seller furnishing and the Buyer accepting this Bond, they agree that all funds earned by the Seller in the performance of the Procurement Task Order are dedicated to satisfying obligations of the Seller and Surety under this Bond, subject to the Buyer's priority to use the funds for the completion of the Goods and Special Services.

10. The Surety shall not be liable to the Buyer, Claimants, or others for obligations of the Seller that are unrelated to the Procurement Task Order. The Buyer shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Procurement Task Order or to related subcontracts, purchase orders, and other obligations.

12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the Point of Destination is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Procurement Task Order, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.

13. Notice and Claims to the Surety, the Buyer, or the Seller must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement where the Point of Destination is located, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Seller and Buyer shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

    16.1. *Buyer Default*—Failure of the Buyer, which has not been remedied or waived, to pay the Seller as required under the Procurement Task Order or to perform and complete or comply with the other material terms of the Procurement Task Order.

    16.2. *Claim*—A written statement by the Claimant including at a minimum:

        16.2.1. The name of the Claimant;

        16.2.2. The name of the person for whom the labor was done, or materials or equipment furnished;

        16.2.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Procurement Task Order;

16.2.4. A brief description of the labor, materials, or equipment furnished;

16.2.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Procurement Task Order;

16.2.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.2.7. The total amount of previous payments received by the Claimant; and

16.2.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.3. *Claimant*—An individual or entity having a direct Task Order with the Seller or with a subcontractor of the Seller to furnish labor, materials, or equipment for use in the performance of the Procurement Task Order. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Point of Destination is located or where the Goods and Special Services are to be installed or furnished. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Procurement, architectural and engineering services required for performance of the work of the Seller and the Seller's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.4. *Goods and Special Services*—The full scope of materials, equipment, other items, and services to be furnished by Seller, as defined in the Procurement Task Order.

16.5. *Point of Destination*—The location where delivery of the Goods shall be made, as stated in the Procurement Task Order.

16.6. *Procurement Task Order*—The contractual agreement between the Buyer and Seller identified on the cover page, including all Procurement Task Order Documents and all changes made to the Procurement Task Order.

16.7. *Procurement Task Order Documents*—All the documents that comprise the contractual agreement between the Buyer and Seller.

17. Modifications to this Bond are as follows: **None**

P625 – BUYER'S ACKNOWLEDGMENT OF RECEIPT OF GOODS

Buyer:	City of Sweet Home	Buyer's Project No.:	
Engineer:	West Yost Associates	Engineer's Project No.:	936-50-21-09
Seller:		Seller's Project No.:	
Project:	Mahler Water Reclamation Facility Interim Improvements Project		
Contract Name:	Mahler WRF Owner-Provided Dewatering Equipment Procurement		

This Buyer's Acknowledgment of Receipt of Goods (Acknowledgment) applies to:

☐ All Goods ☐ The following specified portions of the Goods: **[Specify]**

Date of delivery of the Goods to the Point of Destination: **[Date]**

Date of Buyer's visual inspection of the Goods: **[Date]**

Date of this Acknowledgment: **[Date]**

Buyer acknowledges:

1. The Goods to which this notice applies have been delivered to the Point of Destination.
2. Buyer has visually inspected such Goods pursuant to Paragraph 9.02.B.1 of the General Conditions of the Procurement Contract.
3. Based on the visual inspection, such Goods appear to comply with the requirements of the Procurement Contract Documents as to quantities and condition, subject to any exceptions and limitations in this Acknowledgment.
4. Such Goods are deemed received for purposes of Paragraph 9.02.B.2 of the General Conditions of the Procurement Contract.
5. Seller may submit its Application for Payment for the delivered Goods, subject to the terms of the Procurement Agreement.

Exceptions (if any) to this Acknowledgment: ☐ None ☐ As follows:

The responsibilities between Buyer and Seller for securing and storing the Goods, maintaining the Goods during storage, and for furnishing the Special Services, shall be as provided in the Procurement Contract.

The following documents are attached to and made a part of this Acknowledgement:

[List, if any, or indicate None]

This Acknowledgment does not constitute an acceptance of any Goods not in conformance with the Procurement Contract Documents, nor is it a release of Seller's obligation to furnish all Goods and Special Services in accordance with the Procurement Contract.

Buyer

By (signature): _____

Name (Printed): _____

Title: _____

Date: _____

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P700 – STANDARD GENERAL CONDITIONS OF THE PROCUREMENT TASK ORDER

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ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Whenever used in the Procurement Bidding Requirements or Procurement Task Order Documents and printed with initial capital letters, the terms listed below will have the meanings indicated, which are applicable to the singular or plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Procurement Task Order Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Procurement Task Order Documents.

2. *Application for Payment*—The document prepared by Seller, in a form acceptable to Buyer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Procurement Task Order Documents.

3. *Bid*—An offer or proposal of a prospective Seller submitted on the prescribed form setting forth the prices for the Goods and Special Services to be provided.

4. *Bidder*—An individual or entity that, as a prospective Seller, submits a Bid to Buyer.

5. *Buyer*—The individual or entity purchasing the Goods and Special Services, which is the City of Sweet Home.

6. *Change Directive*—A written directive from Buyer to Seller issued on or after the Effective Date of the Procurement Task Order, ordering an addition, deletion, or revision in the Goods and Special Services.

7. *Change Order*—A document which is signed by Seller and Buyer and authorizes an addition, deletion, or revision to the Procurement Task Order Documents or an adjustment in the Procurement Task Order Price or the Procurement Task Order Times, issued on or after the Effective Date of the Procurement Task Order. Change Orders may be the result of mutual agreement by Buyer and Seller, or of resolution of a Claim.

8. *Claim*—A demand or assertion by Buyer or Seller seeking an adjustment of Procurement Task Order Price or Procurement Task Order Times, or both, or other relief with respect to the terms of the Procurement Task Order. A demand for money or services by a third party is not a Claim.

9. *Days* – shall be defined as a calendar day.

10. *Effective Date of the Procurement Task Order*—The date indicated in the Procurement Agreement on which the Procurement Task Order becomes effective.

11. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

12. *Electronic Means*—Electronic mail (e-mail), upload/download from a secure Project website, or other communications methods that allow: the transmission or communication of Electronic Documents; the documentation of transmissions,

including sending and receipt; printing of the transmitted Electronic Document by the recipient; the storage and archiving of the Electronic Document by sender and recipient; and the use by recipient of the Electronic Document for purposes permitted by this Procurement Task Order. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

13. *Engineer*—The individual or entity designated as such in the Procurement Agreement, which is West Yost Associates, Inc.

14. *Field Order*—A written order issued by Engineer which requires minor changes in the Goods or Special Services, but which does not involve a change in the Procurement Task Order Price or Procurement Task Order Times.

15. *Goods*—The tangible and movable personal property that is described in the Procurement Task Order Documents, regardless of whether the property is to be later attached to realty.

16. *Goods and Special Services*—The full scope of materials, equipment, other items, and services to be furnished by Seller, including Goods, as defined herein, and Special Services, if any, as defined herein. This term refers to both the Goods and the Special Services, or to either the Goods or the Special Services, and to any portion of the Goods or the Special Services, as the context requires.

17. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

18. *Milestone*—A principal event specified in the Procurement Task Order that Seller must attain by the date or within the number of days indicated, including but not limited to the delivery of the Goods and the furnishing of Special Services.

19. *Notice of Award (NOA)* —The written notice, by Buyer to a Bidder, of Buyer's acceptance of the Bid.

20. *Notice to Proceed (NTP)* — The written notice, by Buyer to Seller, directing Seller to begin activities associated the Task Order.

21. *Oregon Business Development Department (OBDD)* – lending agencies providing funding for the Project, otherwise known as the Oregon Infrastructure Finance Authority of the Business Development Department.

22. *Operations Contractor* — the third-party company responsible for operating the facilities, which is Delta Environmental, Inc.

23. *Oregon Health Authority (OHA)* — regulatory agency responsible for public health systems in the State of Oregon.

24. *Oregon Revised Statues (ORS)* – laws and regulations in the State of Oregon, which shall be the governing rules related to the Project.

25. *Point of Destination*—The specific address of the location where delivery of the Goods will be made, as stated in the Procurement Agreement.

26. *Procurement Agreement*—The written instrument, executed by Buyer and Seller, that sets forth the Procurement Task Order Price and Procurement Task Order Times,

identifies the parties and the Engineer, and designates the specific items that are Procurement Task Order Documents.

27. *Procurement Bidding Documents*—The Procurement Bidding Requirements and the proposed Procurement Task Order Documents (including all Addenda).

28. *Procurement Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and Bid Form with any supplements.

29. *Procurement Task Order*—The entire and integrated written agreement between Buyer and Seller concerning the Goods and Special Services.

30. *Procurement Task Order Documents*—Those items so designated in the Procurement Agreement, and which together comprise the Procurement Task Order. Shop Drawings and other Seller submittals are not Procurement Task Order Documents, even if accepted, reviewed, or approved by Engineer or Buyer.

31. *Procurement Task Order Price*—The money that Buyer has agreed to pay Seller for furnishing the Goods and Special Services in accordance with the Procurement Task Order Documents.

32. *Procurement Task Order Times*—The times stated in the Procurement Agreement by which the Goods must be delivered, Special Services must be furnished, and other Milestones must be attained.

33. *Procurement Drawings*—That part of the Procurement Task Order Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Goods and Special Services to be furnished by Seller. Shop Drawings and other Seller submittals are not Procurement Drawings as so defined.

34. *Procurement Specifications*—That part of the Procurement Task Order Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the furnishing of the Goods and Special Services, and certain administrative requirements and procedural matters applicable thereto.

35. *Project*—The total undertaking to be accomplished for Project Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Goods and Special Services are a part.

36. *Project Owner*—The entity that has retained (or will retain) engineers, contractors, and others for the planning, study, design, construction, testing, commissioning, and start-up of facilities and improvements. As of the Effective Date of the Procurement Contract, the Project Owner is the Buyer.

37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Goods and Special Services and which establish the standards by which such portion of the Goods and Special Services will be judged.

38. *Schedule of Submittals*—A schedule, prepared and maintained by Seller, of required Submittals and the time requirements for Engineer's review of the Submittals.

39. *Seller*—The individual or entity furnishing the Goods and Special Services.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Seller and submitted

by Seller to illustrate some portion of the Goods and Special Services. Shop Drawings, whether approved or not, are not Procurement Drawings and are not Procurement Task Order Documents.

41. *Special Services*—Services to be performed by Seller (or its agents or subcontractors) in association with the Goods to be furnished by Seller, as required by the Procurement Task Order Documents.

42. *Submittal*—A written or graphic document, prepared by or for Seller, which the Procurement Task Order Documents require Seller to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or site quality-control testing and inspections; warranties and certifications; suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; record documents; and other such documents required by the Procurement Task Order Documents. Submittals, whether or not approved or accepted by Engineer, are not Procurement Task Order Documents. Change proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

43. *Successful Bidder*—The Bidder whose Bid the Buyer accepts, and to which Buyer makes an award of the Procurement Task Order.

44. *Supplementary Conditions*—The part of the Procurement Task Order that amends or supplements these General Conditions.

45. *TBD*— "to be determined"

46. *Unit Price Goods and Special Services*—Goods and Special Services to be paid for on the basis of unit prices (if any).

47. United States— each of the several states, the District of Columbia, and each Federally Recognized Indian Tribe.

1.02 *Terminology*

A. The words and terms discussed in Paragraphs 1.02.B and 1.02.C are not defined, but have the indicated meanings when used in the Bidding Requirements or Procurement Task Order Documents.

B. *Intent of Certain Terms or Adjectives*

1. The Procurement Task Order Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Goods and Special Services. It is intended that such exercise of professional judgment, action, or determination will be commercially reasonable and will be solely to evaluate, in general, the Goods and Special Services for compliance with the requirements of and information in the Procurement Task Order Documents and conformance with the design concept of the completed Project as a functioning whole, as shown or indicated in the Procurement

Task Order Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective will not be effective to assign to Engineer any duty or authority to supervise or direct the furnishing of Goods or Special Services or any duty or authority to undertake responsibility contrary to any other provision of the Procurement Task Order Documents.

2. The word "non-conforming" when modifying the words "Goods and Special Services," "Goods," or "Special Services," refers to Goods and Special Services that are unsatisfactory, faulty, or deficient in that they:

   a. do not conform to or comply with the requirements of the Procurement Task Order Documents;

   b. do not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Procurement Task Order Documents; or

   c. in the case of Special Services, have not been completed.

3. The word "receipt" when referring to the Goods, means the physical taking and possession by the Buyer under the conditions specified in Paragraph 9.02.B.2.

4. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

5. The word "furnish," when used in connection with the Goods and Special Services means to supply and deliver said Goods to the Point of Destination (or some other specified location) and to perform said Special Services fully, all in accordance with the Procurement Task Order Documents.

C. *Procurement Task Order Price or Procurement Task Order Times*: References to a change in "Procurement Task Order Price or Procurement Task Order Times" or "Procurement Task Order Times or Procurement Task Order Price" or similar, indicate that such change applies to (1) Procurement Task Order Price, (2) Procurement Task Order Times, or (3) both Procurement Task Order Price and Procurement Task Order Times, as warranted, even if the term "or both" is not expressed.

D. Unless stated otherwise in the Procurement Task Order Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Procurement Task Order Documents in accordance with such recognized meaning.

1.03 *Defined Terms Related to American Iron and Steel*

A. American Iron and Steel (AIS) - Requirements mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 (Division A - Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2017) and subsequent statutes mandating domestic preference for "iron and steel products," meaning the following products, if made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials. AIS requirements apply in each of the several states, the District of Columbia, and each federally recognized Tribe, but not the U.S. Territories.

B. Coating - A covering that is applied to the surface of an object. If a Coating is applied to the external surface of a domestic iron or Steel component, and the application takes place

outside of the United States, said product would be considered a compliant product under the AIS requirements. Any Coating processes that are applied to the external surface of Iron and Steel components that would otherwise be AIS compliant would not disqualify the product from meeting the AIS requirements regardless of where the Coating processes occur, provided that final assembly of the product occurs in the United States. This exemption only applies to Coatings on the external surface of Iron and Steel components. It does not apply to Coatings or linings on internal surfaces of Iron and Steel products, such as the lining of lined pipes. All Manufacturing Processes for lined pipes, including the application of pipe lining, must occur in the United States for the product to be compliant with AIS requirements.

C. Construction Materials - Those articles, materials, or supplies made primarily of iron and/or steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered "structural steel". Note: Mechanical and electrical components, equipment and systems are not considered Construction Materials. See definitions of Mechanical Equipment and Electrical Equipment.

D. Seller's Certification - Documentation submitted by the Seller that all Iron and Steel products installed were Produced in the United States.

E. De Minimis - Various miscellaneous, incidental low-cost components that are essential for, but incidental to, the construction and are incorporated into the physical structure of the project. Examples of De Minimis components could include small washers, screws, fasteners (such as "off the shelf" nuts and bolts), miscellaneous wire, corner bead, ancillary tube, signage, trash bins, door hardware etc. Costs for such De Minimis components cumulatively may comprise no more than a total of five percent of the total cost of the materials used in and incorporated into a project; the cost of an individual item may not exceed one percent of the total cost of the materials used in and incorporated into a project.

F. Electrical Equipment - Typically any machine powered by electricity and includes components that are part of the electrical distribution system. AIS does not apply to Electrical Equipment.

G. Engineer's Certification - Documentation submitted by the Engineer that Drawings, Specifications, and Bidding Documents comply with AIS.

H. Iron and Steel products - The following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and Construction Materials. Only items on the above list made primarily of iron or steel, permanently incorporated into the project must be Produced in the United States. For example, trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. iron or steel.

I. Manufacturer - A Supplier, fabricator, distributor, materialman, or vendor is an entity with which the Buyer, Seller or any subSeller has contracted to furnish materials or equipment to be incorporated in the project by the Buyer, Seller, or a subSeller.

J. Manufacturer's Certification - Documentation provided by the Manufacturer stating that the Iron and Steel products to be used in the project are produced in the United States in accordance with American Iron and Steel (AIS) Requirements. If items are purchased via a Supplier, distributor, vendor, etc. from the Manufacturer directly, then the Supplier,

distributor, vendor, etc. will be responsible for obtaining and providing these certifications to the parties purchasing the products.

K. Manufacturing Processes - Processes such as melting, refining, pouring, forming, rolling, drawing, finishing, and fabricating. Further, if a domestic Iron and Steel product is taken out of the United States for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied as a Coating are similarly not covered. Non-iron or Steel components of an Iron and Steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-Iron and Steel components do not have to be of domestic origin. Raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-U.S. sources.

L. Mechanical Equipment - Typically equipment which has motorized parts and/or is powered by a motor. AIS does not apply to Mechanical Equipment.

M. Minor Components - Components within an iron and/or Steel product otherwise compliant with the American Iron and Steel requirements; this waiver is typically used by Manufacturers. It differs from the De Minimis definition in that De Minimis pertains to the entire project and the minor component definition pertains to a single product. This waiver allows use of non-domestically produced miscellaneous Minor Components comprising up to five percent of the total material cost of an otherwise domestically produced Iron and Steel product. However, unless a separate waiver for a product has been approved, all other Iron and Steel components in said product must still meet the AIS requirements. This waiver does not exempt the whole product from the AIS requirements only Minor Components within said product and the iron or Steel components of the product must be produced domestically. Valves and hydrants are also subject to the cost ceiling requirements described here. Examples of Minor Components could include items such as pins and springs in valves/hydrants, bands/straps in couplings, and other low-cost items such as small fasteners etc.

N. Municipal Castings - Cast iron or Steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and solid waste infrastructure.

O. Primarily Iron or Steel - A product is made of greater than 50 percent iron or Steel on a materials cost basis. An exception to this definition is reinforced precast concrete (see Definitions). All technical specifications and applicable industry standards (e.g. NIST, NSF, AWWA) must be met. If a product is determined to be less than 50 percent iron and/or steel, the AIS requirements do not apply. For example, the cost of a fire hydrant includes:

    1. The cost of materials used for the iron portion of a fire hydrant (e.g. bonnet, body and shoe); and

    2. The cost to pour and cast to create those components (e.g. labor and energy).

    3. Not included in the cost are:

        a. The additional material costs for the non-iron or Steel internal workings of the hydrant (e.g. stem, coupling, valve, seals, etc.); and

        b. The cost to assemble the internal workings into the hydrant body.

P. Produced in the United States - The production in the United States of the iron or Steel products used in the project requires that all Manufacturing Processes must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives.

Q. Reinforced Precast Concrete – Reinforced Precast Concrete structures must comply with AIS, regardless of whether or not it consists of at least 50 percent iron or steel. The reinforcing bar and wire must be Produced in the United States and meet the same standards as for any other iron or Steel product. Additionally, the casting of the concrete product must take place in the United States. The cement and other raw materials used in concrete production are not required to be of domestic origin. If the reinforced concrete is cast at the construction site, the reinforcing bar and wire are considered Construction Materials and must be Produced in the United States.

R. Steel - An alloy that includes at least 50 percent iron, between 0.02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of Steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of Steel covers carbon steel, alloy steel, stainless steel, tool steel, and other specialty steels.

S. Structural Steel - Rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees, and zees. Other shapes include but are not limited to, H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Seller delivers the executed counterparts of the Procurement Agreement to Buyer, the Seller also shall deliver to Buyer the performance bond and payment bond (if the Procurement Task Order requires Seller to furnish such bonds).

B. *Evidence of Seller's Insurance*: When Seller delivers the signed counterparts of the Procurement Agreement to Buyer, the Seller also shall deliver to Buyer, with copies to each additional insured (as identified in the Procurement Task Order), the certificates, endorsements, and other evidence of insurance required to be provided by Seller in accordance with Article 5. Evidence of insurance to be obtained at a later date, such as insurance relating to transit or storage of the Goods, will be provided to Buyer at the time of such insurance is obtained.

C. *Evidence of Buyer's Insurance*: After receipt of the signed counterparts of the Procurement Agreement and all required bonds and insurance documentation, Buyer shall promptly deliver to Seller, with copies to each additional insured (as identified in the Procurement Task Order), certificates and other evidence of insurance (if any) required to be provided by Buyer.

2.02 *Copies of Documents*

A. Buyer shall furnish to Seller three printed copies of the Procurement Task Order (including one fully executed counterpart of the Procurement Agreement), and one copy in electronic

portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

2.03 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Procurement Task Order, the Buyer, Seller, and Engineer may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Procurement Task Order does not establish protocols for Electronic Means, then Buyer, Seller, and Engineer shall jointly develop such protocols.

C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

2.04 *Preliminary Schedules*

A. Within 15 days after the Effective Date of the Procurement Task Order, Seller shall submit to Buyer and Engineer for timely review:

1. a progress schedule of activities, consistent with the Procurement Task Order Times, including at a minimum, Shop Drawing and Sample submittals, tests, and deliveries as required by the Procurement Task Order Documents.

a. The progress schedule will be acceptable to Buyer and Engineer if it provides an orderly progression of the Submittals, tests, and deliveries to completion within the specified Milestones of the Procurement Task Order Times.

b. Such acceptance will not impose on Buyer or Engineer responsibility for the progress schedule, for sequencing, scheduling, or progress of Seller's performance of its obligations under the Procurement Task Order, nor interfere with or relieve Seller from Seller's full responsibility therefor.

c. Such acceptance will not be deemed as an acknowledgment of the reasonableness and attainability of the schedule.

2. a preliminary schedule of Submittals.

B. No progress payment will be made to Seller until an acceptable progress schedule and acceptable schedule of Submittals are submitted to Buyer and Engineer (and other conditions applicable to progress payments are met).

2.05 *Preliminary Conference*

A. Within 20 days after the Procurement Task Order Times start to run, a conference attended by Seller, Buyer, Engineer and others as appropriate will be held to establish a working understanding among the parties as to the Goods and Special Services and to discuss the schedules referred to in Paragraph 2.04.A, procedures for handling Shop Drawings and other Submittals, processing Applications for Payment, and maintaining required records.

2.06 *Safety*

A. Buyer and Seller shall comply with all applicable Laws and Regulations relating to the safety of persons or property, and to the protection of persons or property from damage, injury, or loss.

B. When Seller's personnel, or the personnel of any subcontractor to Seller, are present at the Point of Destination or any work area or site controlled by Buyer, the Seller shall be responsible for the compliance by such personnel with any applicable requirements of Buyer's safety programs that are made known to Seller.

C. If Buyer or its representatives visit the Seller's manufacturing or storage facilities, for testing, inspection, or other purposes, Seller shall inform Buyer in advance of any safety preparations, standards, or programs with which Buyer and its representatives must comply.

ARTICLE 3—PROCUREMENT TASK ORDER DOCUMENTS

3.01 *Intent*

A. The Procurement Task Order Documents are complementary; what is called for by one is as binding as if called for by all.

B. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Procurement Task Order Documents or from prevailing custom or trade usage as being required to produce or furnish the indicated Goods and Special Services will be provided, whether or not specifically called for, at no additional cost to Buyer.

C. Unless otherwise stated in the Procurement Task Order Documents, if there is a discrepancy between the electronic or digital versions of the Procurement Task Order Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version will govern.

D. The Procurement Task Order supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Procurement Task Order Documents, as provided in Paragraph 3.04.

F. Any provision or part of the Procurement Task Order Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Buyer and Seller.

3.02 *Reference Standards*

A. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws and Regulations, whether such reference be specific or by implication, means the standard, specification, manual, code, or Laws and Regulations in effect at the time of opening of Bids (or on the Effective Date of the Procurement Agreement if there were no Bids), except as may be otherwise specifically stated in the Procurement Task Order Documents.

B. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a supplier, will be effective to change the duties or responsibilities of Buyer, Seller, or Engineer from those set forth in the part of the Procurement Task Order Documents prepared by or for Engineer. No such provision or instruction will be effective to assign to Buyer or Engineer any duty or authority to supervise or direct the performance of Seller's obligations, or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Procurement Task Order Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Seller's Review of Procurement Task Order Documents*: If, before or during the performance of Seller's obligations, Seller discovers any conflict, error, ambiguity, or discrepancy within the Procurement Task Order Documents, or between the Procurement Task Order Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any supplier to Seller, then Seller shall promptly report it to Engineer in writing. Seller shall not proceed with the Goods and Special Services affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer or by an amendment or supplement to the Procurement Task Order Documents issued pursuant to Article 11.

2. Seller shall not be liable to Buyer or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Procurement Task Order Documents unless Seller had actual knowledge thereof.

B. *Resolving Discrepancies*: Except as may be otherwise specifically stated in the Procurement Task Order Documents, the provisions of the Procurement Task Order Documents will take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Procurement Task Order Documents and:

1. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Procurement Task Order Documents); or

2. the provisions of any Laws or Regulations applicable to the furnishing of the Goods and Special Services (unless such an interpretation of the provisions of the Procurement Task Order Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Procurement Drawings and Procurement Specifications*

A. During the performance of Seller's obligations and until final payment, Seller and Buyer shall submit to the Engineer all matters in question concerning the requirements of the Procurement Drawings and Procurement Specifications (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Goods and Special Services, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Procurement Drawings and Procurement Specifications, and judge of the acceptability of the Goods and Special Services thereunder.

B. Engineer will issue with reasonable promptness a written clarification, interpretation, or decision on the issue submitted, and if necessary, initiate an amendment or supplement to the Procurement Drawings or Procurement Specifications. Engineer's written clarification, interpretation, or decision will be consistent with the overall intent of the Procurement Task Order Documents, and will be final and binding on Seller and Buyer. If either Buyer or Seller believes that a written clarification or interpretation justifies an adjustment in the Procurement Task Order Price or Procurement Task Order Times, either may make a Claim for such adjustment as provided in Article 12.

C. If a submitted matter in question concerns terms and conditions of the Procurement Task Order Documents that do not involve (1) the performance or acceptability of the Goods and

Services, (2) the design (as set forth in the Procurement Drawings, Procurement Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Buyer and Seller that Engineer is unable to provide a decision or interpretation.

3.05 *Reuse of Documents*

A. Seller and its subcontractors and suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Procurement Drawings, Procurement Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Procurement Drawings, Procurement Specifications, other documents, or copies thereof, on extensions of the Project or any other project, without written consent of Buyer and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Procurement Task Order Documents, reuse any such Procurement Task Order Documents for any purpose without Buyer's express written consent, or violate any copyrights pertaining to such Procurement Task Order Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Procurement Task Order. Nothing herein precludes Seller from retaining copies of the Procurement Task Order Documents for record purposes.

3.06 *American Iron and Steel (AIS) Requirements*

A. The Seller acknowledges to and for the benefit of the City of Sweet Home ("Buyer") and the State of Oregon (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Seller pursuant to this Agreement. The Seller hereby represents and warrants to and for the benefit of the Buyer and the State that (a) the Seller has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Seller will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Buyer or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Seller shall permit the Buyer or State to recover as damages against the Seller any loss, expense, or cost (including without limitation attorney's fees) incurred by the Buyer or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Buyer). While the Seller has no direct contractual privity with the State, as a lender to the Buyer for the funding of its project, the Buyer and the Seller agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this

paragraph force or effect) shall be amended or waived without the prior written consent of the State.

ARTICLE 4—COMMENCEMENT AND SCHEDULE

4.01 *Commencement of Procurement Task Order Times*

A. The Procurement Task Order Times will commence to run on the Effective Date of the Procurement Task Order.

4.02 *Continuing Performance*

A. Seller shall adhere to the progress schedule established in accordance with Paragraph 2.04.A., as duly adjusted, and the Goods will be delivered and the Special Services furnished within the Procurement Task Order Times.

B. Seller shall carry on furnishing of the Goods and Special Services and adhere to the progress schedule during all disputes or disagreements with Buyer. No furnishing of Goods and Special Services will be delayed or postponed pending resolution of any disputes or disagreements, except as expressly permitted herein, or as Buyer and Seller may otherwise agree in writing.

4.03 *Adjustments to Progress Schedule*

A. The progress schedule established in accordance with Paragraph 2.04 may be adjusted from time to time as provided below.

1. Seller shall submit to Buyer for acceptance (to the extent indicated in Paragraph 2.04) proposed adjustments in the progress schedule that will not result in changing the Procurement Task Order Times. Such adjustments will comply with any applicable provisions of the Procurement Specifications.

2. Proposed adjustments in the progress schedule that will change the Procurement Task Order Times must be submitted in accordance with the requirements of Article 11. Adjustments in Procurement Task Order Times may only be made by a Change Order.

4.04 *Delays*

A. If Buyer, Engineer, or anyone for whom Buyer is responsible, delays, disrupts, or interferes with Seller's performance or progress, then Seller shall be entitled to an equitable adjustment in Procurement Task Order Price or Procurement Task Order Times.

B. Seller shall not be entitled to an adjustment in Procurement Task Order Price or Procurement Task Order Times for delay, disruption, or interference caused by or within the control of Seller or anyone for whom Seller is responsible.

C. If Seller's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Buyer, Seller, and those for which they are responsible, then Seller shall be entitled to an equitable adjustment in Procurement Task Order Times. Such an adjustment will be Seller's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Procurement Task Order Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. abnormal weather conditions;
3. inspection delays by governmental authorities, and custom delays;
4. international shipping delays;
5. acts or failures to act of third-party entities; and
6. acts of war or terrorism.
7. Weather-Related Delays

    a. If "abnormal weather conditions" as set forth in Paragraph 4.04.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Task Order Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

    b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:

        1) Every workday on which one or more of the following conditions exist will be considered a "bad weather day":

            i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds **1.0** inches of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC-4.05.C by reference.

            ii) Ambient outdoor air temperature for 60 minutes between the hours of 10:00 a.m. and 3:00 p.m. is equal to or less than the following low temperature threshold: **15** degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: **100** degrees Fahrenheit.

        2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by the City of Sweet Home Public Works Department.

        3) Seller shall anticipate the number of foreseeable bad weather days per month indicated in the table below —Foreseeable Bad Weather Days.

        4) Seller shall include the following Foreseeable Bad Weather Days in the Progress Schedule as follows:

            i) January – 3 Days

            ii) February – 2 Days

            iii) March – 1 Day

            iv) April – 1 Days

            v) May – 0 Days

vi) June – 0 Days

vii) July – 1 Days

viii) August – 2 Days

iv) September – 1 Days

v) October – 1 Day

vi) November – 2 Days

vii) December – 3 Days

5) In each month, every bad weather day exceeding the number of Foreseeable Bad Weather Days will be considered as "abnormal weather conditions." The existence of abnormal weather conditions will not relieve Seller of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Seller's then-current Progress Schedule's critical path for the Project.

6) If mutually agreed upon by Buyer and Seller, working hours during days with anticipated abnormal weather periods can be adjusted to allow work earlier or later in the day depending on the type of abnormal weather expected.

D. *Adjustments of Procurement Task Order Times or Procurement Task Order Price—General Provisions*: Seller's entitlement to an adjustment of Procurement Task Order Times or Procurement Task Order Price is limited as follows:

1. Seller's entitlement to an adjustment of the Procurement Task Order Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of Seller's obligations, as of the time of the delay, disruption, or interference.

2. Seller shall not be entitled to an adjustment in Procurement Task Order Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Seller. Such a concurrent delay by Seller does not preclude an adjustment of Procurement Task Order Times to which Seller is otherwise entitled.

3. Adjustments of Procurement Task Order Times or Procurement Task Order Price are subject to the provisions of Articles 11 and 12.

E. Each Seller request seeking a delay-related increase in Procurement Task Order Times or Procurement Task Order Price must be supplemented by supporting data that sets forth in detail the following: (1) the circumstances that form the basis for the requested adjustment; (2) the date upon which each cause of delay, disruption, or interference began to affect Seller's progress; (3) the date upon which each cause of delay, disruption, or interference ceased to affect Seller's progress; (4) the number of days' increase in Procurement Task Order Times claimed as a consequence of each such cause of delay, disruption, or interference; and (5) the impact on Procurement Task Order Price. Seller shall also furnish such additional supporting documentation as Buyer or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion.

ARTICLE 5—BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Seller shall furnish a performance bond and a payment bond, each in an amount at least equal to the Procurement Task Order Price, as security for the faithful performance and payment of Seller's obligations under the Procurement Task Order. These bonds must remain in effect until three years after the date when final payment becomes due or until completion of the correction period specified in Paragraph 9.04, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Procurement Task Order.

1. *Required Performance Bond Form*: The performance bond that Seller furnishes will be in the form of EJCDC® P-610, Performance Bond (2010 or 2019 edition).

2. *Required Payment Bond Form*: The payment bond that Seller furnishes will be in the form of EJCDC® P-615, Payment Bond (2010 or 2019 edition).

B. Seller shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Procurement Task Order.

C. All bonds must be in the form specified by Buyer prior to execution of the Procurement Task Order, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Seller shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Seller is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Seller shall promptly notify Buyer and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements of this Procurement Task Order.

F. If Seller has failed to obtain a required bond, Buyer may exercise Buyer's termination rights under Article 14.

G. Upon request to Buyer from any subcontractor, supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of Seller's obligations, Buyer shall provide a copy of the payment bond to such person or entity.

H. Upon request to Seller from any subcontractor, supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of Seller's obligations, Seller shall provide a copy of the payment bond to such person or entity.

5.02 *Insurance—General Provisions*

A. Buyer and Seller shall obtain and maintain insurance as required in this procurement Task Order and City of Sweet Home Special Provisions.

B. Seller's insurance required by the Task Order shall be primary over Buyer's insurance and shall include a waiver of subrogation against Buyer and Engineer.

C. All insurance required by the Task Order to be purchased and maintained by Buyer or Seller shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. All companies that provide insurance policies required under this Task Order shall have an A.M. Best rating of A-VII or better.

D. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Task Order.

E. Seller shall deliver to Buyer, with copies to each additional insured identified in the Task Order, certificates of insurance and endorsements establishing that Seller has obtained and is maintaining the policies and coverages required by the Task Order. Upon request by Buyer or any other insured, Seller shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Seller, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Task Order.

F. Buyer shall deliver to Seller, with copies to each additional insured identified in the Task Order, certificates of insurance and endorsements establishing that Buyer has obtained and is maintaining the policies and coverages required of Buyer by the Task Order (if any). Upon request by Seller or any other insured, Buyer shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Buyer may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Task Order.

G. Failure of Buyer or Seller to demand such certificates or other evidence of the Seller's full compliance with these insurance requirements, or failure of Buyer or Seller to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the Seller's obligation to obtain and maintain such insurance.

H. In addition to the liability insurance required to be provided by Seller, the Buyer, at Buyer's option, may purchase and maintain Buyer's own liability insurance. Buyer's liability policies, if any, operate separately and independently from policies required to be provided by Seller, and Seller cannot rely upon Buyer's liability policies for any of Seller's obligations to the Buyer, Engineer, or third parties.

I. Seller shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Buyer and Engineer (and any other individuals or entities identified in the General Conditions as additional insureds on Seller's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

J. If either party does not purchase or maintain the insurance required of such party by the Task Order, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

K. If Seller has failed to obtain and maintain required insurance, Seller's entitlement to enter or remain at the Site will end immediately, and Buyer may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Buyer's termination rights under Article 14.

L. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Task Order Price will be adjusted accordingly.

M. Buyer does not represent that insurance coverage and limits established in this Task Order necessarily will be adequate to protect Seller or Seller's interests. Seller is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Seller deems necessary.

N. The insurance and insurance limits required herein will not be deemed as a limitation on Seller's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Buyer and other individuals and entities in the Task Order or otherwise.

O. All the policies of insurance required to be purchased and maintained under this Task Order will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each additional insured.

6.03 Seller's Insurance

A. *Required Insurance*: Seller shall purchase and maintain Worker's Compensation, Commercial General Liability, Builders Risk and other insurance pursuant to the specific requirements set forth herein.

B. *General Provisions*: The policies of insurance required by this Paragraph 5.03 must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Article 13), and longer if expressly required elsewhere in this Task Order, and at all times thereafter when Seller may be correcting, removing, or replacing defective Work as a warranty or correction

obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Task Order;

4. apply with respect to the performance of the Work, whether such performance is by Seller, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Seller's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Task Order, must:

1. include and list as additional insureds the following:

a. BUYER: "City of Sweet Home, its officers, employees, agents, and consultants"; AND

b. ENGINEER: "West Yost Associates Inc., its officers, employees, agents, and consultants"; AND

c. any individuals or entities identified as additional insureds herein.

2. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

3. not seek contribution from insurance maintained by the additional insured; and

4. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Seller's acts or omissions, or the acts and omissions of those working on Seller's behalf, in the performance of Seller's operations.

D. Other Additional Insureds: As a supplement to the provisions of Paragraph 5.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds the Buyer and Engineer.

E. *Workers' Compensation and Employer's Liability Insurance:* Seller shall purchase and maintain Worker's Compensation and Employer's Liability Insurance. This insurance shall protect SELLER against all claims under applicable state workers' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. SELLER shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This policy shall include an "all states" or "other states" and waiver of subrogation endorsements. The liability limits, as required by state law shall be not less than:

1. Workers' Compensation: Statutory

2. Employer's Liability: $1,000,000 each occurrence

F. *Commercial General Liability—Claims Covered:* Seller shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Seller, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Seller's employees,

2. damages insured by reasonably available personal injury liability coverage, and

3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Seller's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.

   a. Such insurance must be maintained for three years after final payment.

   b. Seller shall furnish Buyer and each other additional insured (as identified in the General Conditions or elsewhere in the Task Order) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, including but not limited to coverage of Seller's contractual indemnity obligations in Paragraph 7.107.

3. Severability of interests and no insured-versus-insured or cross-liability exclusions.

4. Underground, explosion, and collapse coverage.

5. Personal injury coverage.

6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Seller demonstrates to Buyer that the specified ISO endorsements are not commercially available, then Seller may satisfy this requirement by providing equivalent endorsements.

7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability Insurance Coverage:* This insurance shall be occurrence type written in comprehensive form and shall protect SELLER, BUYER, and ENGINEER as additional insureds, against claims arising out of performance of the Work. The policy shall also include personal injury liability coverage, contractual liability coverage, completed operations and products liability coverage, and coverage for blasting, explosion, collapse of buildings, and damage to underground property. The liability limits for bodily injury and property damage shall be not less than:

1. Combined Single Limit for each occurrence: $2,000,000

2. General aggregate: $2,000,000

I. *Automobile Liability:* Seller shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	**Policy limits of not less than:**
Bodily Injury	
Each Person	$1,000,000
Each Accident	$1,000,000

Automobile Liability	Policy limits of not less than:
Property Damage	
Each Accident	$1,000,000
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$2,000,000

J. Umbrella Liability Insurance: Seller shall purchase and maintain umbrella liability insurance. This insurance shall protect SELLER, BUYER, and ENGINEER as additional insureds, against claims in excess of the limits provided under workers' compensation and employer's liability, comprehensive automobile liability, and commercial general liability policies. The umbrella policy shall follow the form of the primary insurance, including the application of the primary limits. The liability limits for bodily injury and property damage shall be not less than:

1. Combined Single Limit for each occurrence: $5,000,000
2. General aggregate: $5,000,000

K. *Pollution Liability Insurance:* If not otherwise included in the Seller's Commercial General Liability Insurance coverage, Seller shall purchase and maintain pollution liability insurance for claims arising from the discharge, dispersal, release, escape of any irritant or contaminant into or upon land, any structure, the atmosphere, watercourse, or body of water including groundwater. This shall include coverage for claims of: (a) clean up, either on-site or off site; (b) third party liability, including bodily injury, property damage, natural resource damage, third party property loss of use/revenue, and clean up; and/or (c) costs incurred for regulatory fines and/or the investigation, defense, or settlement of claims. The liability limits for pollution shall not be less than:

1. Combined Single Limit for each occurrence: $5,000,000
2. General aggregate: $5,000,000

L. *Railroad Protective Liability Insurance:* Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Seller shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Buyer, and (4) submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Buyer of such submittal.

Railroad Protective Liability Insurance	Policy limits of not less than:
Each Claim	$ 1,000,000
Aggregate	$ 2,000,000

M. *Unmanned Aerial Vehicle Liability Insurance:* If Seller uses unmanned aerial vehicles (UAV—commonly *referred* to as drones) at the Site or in support of any aspect of the Work, Seller shall obtain UAV liability insurance in the amounts stated; name Buyer, Engineer, and all individuals and entities identified in the General Conditions as additional insureds; and provide a certificate to Buyer confirming Seller's compliance with this requirement. Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy.

Unmanned Aerial Vehicle Liability Insurance	Policy limits of not less than:
Each Claim	$ 100,000
General Aggregate	$ 250,000

6.04 Builder's Risk and Other Property Insurance

A. *Builder's Risk*: Seller shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the General Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the General Conditions.

B. *Property Insurance for Facilities of Buyer Where Work Will Occur*: Buyer is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Article 13.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Buyer will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Article 13. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Buyer's procurement of such property insurance.

D. *Partial Occupancy or Use by Buyer*: If Buyer will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, , then Buyer (directly, if it is the purchaser of the builder's risk policy, or through Seller) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Task Order do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Seller elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Seller's expense.

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Buyer and Seller.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Buyer-furnished or assigned property; (b) spare parts inventory required within the scope of the Task Order; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of Sellers, engineers, and architects).

4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier). If this coverage is subject to a sublimit, such sublimit will be a minimum of $2,000,000.

5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of $2,000,000.

6. allow for the waiver of the insurer's subrogation rights, as set forth in this Task Order.

7. allow for partial occupancy or use by Buyer by endorsement, and without cancellation or lapse of coverage.

8. include performance/hot testing and start-up, if applicable.

9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Buyer's procurement of property insurance following Substantial Completion, whichever occurs first.

10 include as named insureds the Buyer, Seller, Subcontractors (of every tier), and any other individuals or entities required by this Task Order to be insured under such builder's risk policy. Parties required to be insured will be referred to collectively as "insureds." In addition to Buyer, Seller, and Subcontractors of every tier, include as insureds the following:

a. West Yost Associates, Inc.
Charles Duncan, President
2020 Research Park Drive, Suite 100
Davis, CA 95618
503.756.5905; CDuncan@westyost.com

11. include, in addition to the Task Order Price amount, the value of the following equipment and materials to be installed by the Seller but furnished by the Buyer or third parties:

    a. Electrical motor control centers, control panels and other equipment to be supplied by Buyer's Integrator-of-Record, such sublimit will be a minimum of $3,000,000.

12. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of $5,000,000.

6.05 Property Losses; Subrogation

A. The builder's risk insurance policy purchased and maintained, at Contactor's expense, in accordance with Paragraph 5.04 (or an installation floater policy if authorized), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

    1. Buyer and Seller waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the General Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

    2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Buyer or Seller as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Buyer covering any loss, damage, or consequential loss to Buyer's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Buyer; or to part or all of the completed or substantially completed Work, during partial occupancy or use, after Substantial Completion, or after final payment pursuant to Paragraph 13.05, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Seller, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written Task Order executed prior to the loss, damage, or consequential loss.

    1. Buyer waives all rights against Seller, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 5.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Buyer's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Seller shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Buyer, Seller, all individuals or entities identified in the General Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 Receipt and Application of Property Insurance Proceeds

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 5.04 will be adjusted and settled with the Seller and Buyer. Seller and Buyer shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer to the Seller and Buyer as the fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. Seller and Buyer receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Task Order or applicable Laws and Regulations.

C. If no other special agreement is reached, Seller shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 6—LICENSES AND FEES

6.01 *Intellectual Property and License Fees*

A. Except to the extent stated elsewhere in the Procurement Task Order Documents, Seller is not transferring any patent rights, copyrights, or other intellectual property rights for the Goods delivered.

B. To the extent Seller is manufacturing to Buyer's design, Buyer retains all patent rights, copyrights, and other intellectual property rights in such design.

C. If an invention, design, process, product, or device is specified in the Procurement Task Order Documents for incorporation in the Goods or for the performance of Special Services, and if, to the actual knowledge of Buyer or Engineer, its use is subject to patent rights, copyrights, or other intellectual property rights calling for the payment of a license fee or royalty to others, then the existence of such rights and payment obligations will be disclosed to Seller in the Procurement Task Order Documents.

D. Seller shall pay all license fees and royalties and assume all costs incident to the use or the furnishing of the Goods, unless specified otherwise by the Procurement Task Order Documents.

6.02 *Seller's Infringement*

A. Subject to Paragraph 6.01, to the fullest extent permitted by Laws and Regulations, Seller shall indemnify and hold harmless Buyer, Engineer, and their officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors, from and against

all claims, costs, losses, damages, and judgments (including but not limited to all reasonable fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement or alleged infringement of any patent, copyright, or other intellectual property right by any of the Goods as delivered or Special Services as performed.

B. Buyer will promptly notify Seller in writing of any claim, suit, or threat of suit by a third party for any infringement or alleged infringement of any patent, copyright, or other intellectual property right with respect to the Goods as delivered or Special Services as performed.

C. Seller shall promptly defend or settle the claim or suit. Seller shall have control over such claim or suit, bear all expenses, and satisfy any adverse judgment.

1. If Seller fails to defend such suit or claim after written notice by Buyer, Seller will be bound, in any subsequent suit or claim against Seller by Buyer, by any factual determination in the prior suit or claim.

2. If Buyer fails to provide Seller the opportunity to defend such suit or claim, Buyer shall be barred from any remedy against Seller for such suit or claim.

D. If a determination is made that Seller has infringed upon the intellectual property rights of another, Seller may, at Seller's own expense, obtain the necessary licenses for Buyer's benefit, or replace the Goods and provide related design and construction, consistent with the requirements of the Procurement Task Order Documents, to avoid the infringement.

6.03 *Buyer's Infringement*

A. Subject to Paragraph 6.01, and to the fullest extent permitted by Laws and Regulations, Buyer shall be responsible to Seller for any infringement or alleged infringement of any patent, copyright, or other intellectual property right caused by Seller's compliance with the Procurement Drawings or Procurement Specifications, and will reimburse Seller for any license fee or royalties paid by Seller to others if such payment resulted from any invention, design, process, product, or device specified to be furnished or performed in the Procurement Drawings or Procurement Specifications, but not identified as being subject to payment of such license fee or royalty.

B. Seller will promptly notify Buyer in writing of any claim, suit, or threat of suit by a third party for intellectual property infringement arising from Seller's compliance with the Procurement Drawings or Procurement Specifications.

C. Buyer shall defend or settle the claim or suit. Buyer shall have control over such claim or suit, bear all expenses, and satisfy any adverse judgment.

1. If Buyer fails to defend such suit or claim after written notice by Seller, Buyer will be bound, in any subsequent suit or claim against Buyer by Seller, by any factual determination in the prior suit or claim.

2. If Seller fails to provide Buyer the opportunity to defend such suit or claim, Seller shall be barred from any remedy against Buyer for such suit or claim.

ARTICLE 7—SELLER'S RESPONSIBILITIES

7.01 *Performance of Obligations*

A. Seller shall be solely responsible for the means, methods, techniques, sequences, and procedures necessary to perform its obligations in accordance with the Procurement Task Order Documents.

B. Seller shall supervise, inspect, and direct the furnishing of the Goods and Special Services competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform its obligations in accordance with the Procurement Task Order Documents.

C. Seller shall coordinate the provision of Special Services to avoid or limit interference or disruption of other activities at the location where the Special Services are to occur, including but not limited to ongoing facility operations and construction activities.

7.02 *Labor, Materials and Equipment*

A. Seller shall provide competent, qualified and trained personnel in all aspects of its performance of the Procurement Task Order.

B. All Goods, and all equipment and material incorporated into the Goods, must be as specified, and unless specified otherwise in the Procurement Task Order Documents, must be:

1. new, and of good quality;

2. protected, assembled, connected, cleaned, and conditioned in accordance with the original manufacturer's instructions; and

3. shop-assembled to the greatest extent practicable.

7.03 *Laws and Regulations*

A. Seller shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of its obligations in accordance with the Procurement Task Order Documents. Except where otherwise expressly required by such Laws and Regulations, neither Buyer nor Engineer shall be responsible for monitoring Seller's compliance with any Laws or Regulations.

B. If Seller furnishes Goods and Special Services knowing or having reason to know that such furnishing is contrary to Laws or Regulations, Seller shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such performance. It will not be Seller's responsibility to make certain that the Procurement Specifications and Procurement Drawings are in accordance with Laws and Regulations, but this provision will not relieve Seller of Seller's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Procurement Task Order if there were no Bids) that have a direct effect on the cost or time of Seller's performance will be the subject of an adjustment in Procurement Task Order Price or Procurement Task Order Times. If Buyer and Seller are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Article 12.

D. Seller shall comply with all applicable state and federal regulations as required by the Oregon Infrastructure Finance Authority of the Business Development Department and Oregon Health Authority, including, but not limited to:

1. Design and fabrication shall comply with application sections of ORS Chapter 333 Division 61 for Drinking Water, establishing design and construction standards for drinking water systems in Oregon.

2. State procurement regulations found in the Oregon Public Contracting Code, ORS chapters 279A, 279B and 279C.

3. State labor standards and wage rates found in ORS 279C.

4. Manufacturer's certification of compliance with the American Iron and Steel (AIS) requirements of Section 746, Division A, Title VII of the Consolidated Appropriations Act of 2017.

   a. "Iron and steel products" are defined as the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

   b. Only items on the above list made primarily of iron or steel, permanently incorporated into the project must be produced in the United States. For example trench boxes, scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.

   c. "Minor components" are components within an iron and/or steel product otherwise compliant with the American Iron and Steel requirements. This is different from the de minimis definition where de minimis pertains to the entire project and the minor component definition pertains to a single product. This waiver, would allow non-domestically produced miscellaneous minor components comprising up to five percent of the total material cost of an otherwise domestically produced iron and steel product to be used. This waiver does not exempt the whole product from the AIS requirements only minor components within said product and the iron or steel components of the product must be produced domestically.

7.04 *"Or Equals"*

A. Whenever an item of material or equipment to be incorporated into the Goods is specified or described in the Procurement Task Order Documents by using the names of one or more proprietary items or specific suppliers or manufacturers, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, other items of material or equipment or material or equipment of other suppliers or manufacturers may be submitted to Buyer for Engineer's review.

1. If in Engineer's sole discretion, such an item of material or equipment proposed by Seller is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by Engineer as an "or equal" item.

2. For the purposes of this paragraph, a proposed item of material or equipment may be considered functionally equal to an item so named only if in the exercise of reasonable judgment, Engineer determines that: 1) it is at least equal in quality, durability, appearance, strength, and design characteristics; 2) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; 3) it has an acceptable record of performance and availability of responsive service; and (4) Seller certifies that if approved: a) there will be no increase in any cost, including capital, installation or operating costs, to Buyer; and b) the proposed item will conform substantially to the detailed requirements of the item named in the Procurement Task Order Documents.

B. *Engineer's Evaluation*: Engineer will be allowed a reasonable time within which to evaluate each proposal or Submittal made pursuant to Paragraph 7.04.A. Engineer will be the sole judge of whether to accept or reject such a proposal or Submittal. No "or equal" will be ordered, manufactured or utilized until Engineer's review is complete, which will be evidenced by an approved Shop Drawing. Engineer will advise Buyer and Seller in writing of any negative determination. Notwithstanding Engineer's approval of an "or-equal" item, Seller shall remain obligated to comply with the requirements of the Procurement Task Order Documents.

C. *Special Guarantee*: Buyer may require Seller to furnish at Seller's expense a special performance guarantee or other surety with respect to any such proposed "or-equal."

D. *Data*: Seller shall provide all data in support of any such proposed "or equal" at Seller's expense.

7.05 *Taxes*

A. Seller shall pay all taxes and duties arising out of the sale of the Goods and the performance of Special Services. All taxes and duties are included in the Procurement Task Order Price, except as noted in the General Conditions.

7.06 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Seller shall:

a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Procurement Task Order Documents;

b. determine and verify:

1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal; and

2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of Seller's obligations.

c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Seller has satisfied its obligations under the Procurement Task Order Documents with respect to Seller's review of that Submittal, and that Seller approves the Submittal.

3. With each Shop Drawing or Sample, Seller shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Procurement Task Order Documents. This notice will be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples*: Seller shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*

a. Seller shall submit the number of copies required in the Procurement Specifications.

b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Seller proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.06.C.

2. *Samples*

a. Seller shall submit the number of Samples required in the Procurement Specifications.

b. Seller shall clearly identify each Sample as to material, supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.06.C.

3. Where a Shop Drawing or Sample is required by the Procurement Task Order Documents or the Schedule of Submittals, any related work performed by Seller prior to Engineer's review and approval of the pertinent Submittal will be at the sole expense and responsibility of Seller.

C. *Engineer's Review of Shop Drawings and Samples*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's favorable review will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Goods, comply with the requirements of the Procurement Task Order Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Procurement Task Order Documents.

2. Engineer's favorable review will not extend to means, methods, techniques, sequences, or procedures of construction, manufacturing, fabrication, installation, or shipping, or to safety precautions or programs incident thereto.

3. Engineer's favorable review of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's favorable review of a Shop Drawing or Sample will not relieve Seller from responsibility for any variation from the requirements of the Procurement Task Order Documents unless Seller has complied with the requirements of Paragraph 7.06.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Procurement Task Order Documents in a Field Order or other appropriate Procurement Task Order modification.

5. Engineer's favorable review of a Shop Drawing or Sample will not relieve Seller from responsibility for complying with the requirements of Paragraphs 7.06.A and B.

6. Engineer's favorable review of a Shop Drawing or Sample, or of a variation from the requirements of the Procurement Task Order Documents, will not, under any circumstances, change the Procurement Task Order Times or Procurement Task Order Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, acceptance or favorable review of a Shop Drawing or Sample will result in such item becoming a Procurement Task Order Document.

8. Seller shall furnish Goods that comply with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.06.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

1. Seller shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Seller shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.

2. Seller shall furnish required Shop Drawing and Sample Submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Seller shall be responsible for Engineer's charges to Buyer for such time. Buyer may impose a set-off against payments due Seller to secure reimbursement for such charges.

3. If Seller requests a change of a previously favorably reviewed Shop Drawing or Sample, Seller shall be responsible for Engineer's charges to Buyer for its review time, and Buyer may impose a set-off against payments due Seller to secure reimbursement for such charges, unless the need for such change is beyond the control of Seller.

E. *Submittals Other than Shop Drawings and Samples*

1. The following provisions apply to all Submittals other than Shop Drawings and Samples:

   a. Seller shall submit all such Submittals to the Engineer in accordance with the schedule of Submittals and pursuant to the applicable terms of the Procurement Task Order Documents.

   b. Engineer will provide timely review of all such Submittals in accordance with the schedule of Submittals and return such Submittals with a notation of either

Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the schedule of Submittals will be deemed accepted.

c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Procurement Task Order Documents as to general form and content of the Submittal.

d. If any such Submittal is not accepted, Seller shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.04 and 2.05.

7.07 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Seller shall indemnify and hold harmless Buyer, Engineer, Operations Contractor, Project Owner, and any assignee of Buyer, and their officers, directors, members, partners, employees, agents, consultants, contractors, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of Seller's obligations under the Procurement Task Order, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Goods themselves), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Seller, or any individual or entity directly or indirectly employed by Seller or anyone for whose acts Seller may be liable.

B. In any and all claims against Buyer, Engineer, Project Owner, or any assignee of Buyer, including Contractor/Assignee, or their officers, directors, members, partners, employees, agents, consultants, contractors, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Seller, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to furnish any of the Goods and Special Services, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.07.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Seller or any such subcontractor, supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.08 *Concerning Subcontractors and Suppliers*

A. Seller may retain subcontractors and suppliers for the performance of parts of the furnishing of the Goods and Special Services. The Seller's retention of a subcontractor or supplier will not relieve Seller's obligation to Buyer to perform and complete the furnishing the Goods and Special Services in accordance with the Procurement Task Order Documents.

ARTICLE 8—SHIPPING AND DELIVERY

8.01 *Shipping*

A. Seller shall select the carrier and bear all costs of packaging, transportation, insurance, special handling, and all other costs associated with shipment and delivery.

8.02 *Delivery*

A. Seller shall deliver the Goods free on board (FOB) to the Point of Destination, freight prepaid, in accordance with the Procurement Task Order Times set forth in the Procurement Agreement, or other date agreed to by Buyer and Seller.

B. At least 10 days before shipment, Seller shall provide written notice to Buyer of the manner of shipment and the anticipated delivery date. The notice must also include any instructions concerning special equipment or services required at the Point of Destination to unload and care for the Goods. Seller shall also require the carrier to give Buyer at least 24 hours' notice by telephone prior to the anticipated time of delivery.

C. Buyer will be responsible and bear all costs for unloading the Goods from carrier.

D. Buyer will assure that adequate facilities are available to receive delivery of the Goods at the time established for delivery, or on another date agreed to by Buyer and Seller.

E. No partial deliveries will be allowed, unless permitted or required by the Procurement Task Order Documents or agreed to in writing by Buyer.

F. Provisions governing inspection on delivery are set forth in Paragraph 9.02.

8.03 *Risk of Loss*

A. Risk of loss and insurable interests transfer from Seller to Buyer upon Buyer's receipt of the Goods.

B. Notwithstanding the provisions of Paragraph 8.03.A, if Buyer rejects the Goods as non-conforming, the risk of loss on such Goods will remain with Seller until Seller corrects the non-conformity or Buyer accepts the Goods. If rejected Goods remain at the Point of Destination pending modification and acceptance, then Seller shall be responsible for arranging adequate protection and maintenance of the Goods at Seller's expense.

ARTICLE 9—BUYER'S RIGHTS

9.01 *Seller's Warranties and Guarantees*

A. Seller warrants and guarantees to Buyer that the title to the Goods conveyed will be proper, its transfer rightful, and free from any security interest, lien, or other encumbrance. Seller shall defend, indemnify, and hold Buyer harmless against any liens, claims, or demands contesting or affecting title of the Goods conveyed.

B. Seller warrants and guarantees to Buyer that all Goods and Special Services will conform with the Procurement Task Order Documents, and with the standards established by any Samples approved by Engineer. Engineer shall be entitled to rely on Seller's warranty and guarantee. If the Procurement Task Order Documents do not otherwise specify the characteristics or the quality of the Goods, the Goods must comply with the requirements of Paragraph 7.02.B.

C. Seller's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, improper modification, improper maintenance, or improper operation by persons other than Seller;

2. excessive corrosion or chemical attack, unless corrosive or chemically-damaging conditions were disclosed by Buyer in the Procurement Task Order Documents and the Procurement Task Order Documents required the Goods to withstand such conditions;

3. use in a manner contrary to Seller's written instructions for installation, operation, and maintenance; or

4. normal wear and tear under normal usage.

D. Seller's obligation to furnish the Goods and Special Services in accordance with the Procurement Task Order Documents will be absolute. None of the following will constitute an acceptance of Goods and Special Services that are non-conforming, or a release of Seller's obligation to furnish the Goods and Special Services in accordance with the Procurement Task Order Documents:

1. observations by Buyer, Engineer, or Project Owner;

2. recommendation by Engineer or payment by Buyer of any progress or final payment;

3. use of the Goods by Buyer or Project Owner;

4. any acceptance by Buyer, Engineer, or Project Owner, or any failure to do so;

5. the end of the correction period established in Paragraph 9.04;

6. the issuance of a notice of acceptance;

7. any inspection, test or approval by others; or

8. any correction of non-conforming Goods and Special Services by Buyer or Project Owner.

E. Buyer shall promptly notify Seller of any breach of Seller's warranties or guarantees.

9.02 *Inspections and Testing*

A. *General Provisions*

1. The Procurement Task Order Documents specify required inspections and tests. Buyer shall have the right to perform, or cause to be performed, reasonable inspections and require reasonable tests of the Goods at Seller's facility, and at the Point of Destination. Seller shall allow Buyer a reasonable time to perform such inspections or tests.

2. Seller shall reimburse Buyer for all expenses, except for travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, for inspections and tests specified in the Procurement Task Order Documents. If as the result of any such specified testing the Goods are determined to be non-conforming, then Seller shall also bear the travel, lodging, and subsistence expenses of Buyer's and Engineer's representatives, and all expenses of re-inspection or retesting.

3. Buyer shall bear all expenses of inspections and tests that are not specified in the Procurement Task Order Documents (other than any re-inspection or retesting resulting from a determination of non-conformity, as set forth in Paragraph 9.03); provided, however, that if as the result of any such non-specified inspections or testing the Goods are determined to be non-conforming, then Seller shall bear all expenses of such inspections and testing, and of any necessary re-inspection and retesting.

4. Seller shall provide Buyer timely written notice of the readiness of the Goods for all inspections, tests, or approvals which the Procurement Task Order Documents specify are to be observed by Buyer prior to shipment.

5. Buyer will give Seller timely notice of all specified tests, inspections, and approvals of the Goods which are to be conducted at the Point of Destination, and a representative of Seller will attend such tests, inspections, and approvals.

6. If, on the basis of inspections or testing, the Goods appear to be conforming, Buyer will give Seller prompt notice thereof. If on the basis of inspections or testing, the Goods appear to be non-conforming, Buyer will give Seller prompt notice thereof and will advise Seller of the remedy Buyer elects under the provisions of Paragraph 9.03.

7. Neither payments made by Buyer to Seller prior to any tests or inspections, nor any tests or inspections, will constitute acceptance of non-conforming Goods, or prejudice Buyer's rights under the Procurement Task Order.

B. *Visual Inspection on Delivery*

1. Buyer will visually inspect the Goods upon delivery solely for purposes of identifying the Goods, general verification of quantities, and observation of apparent condition. Such visual inspection will not be construed as final or as receipt of any Goods and Special Services that, as a result of subsequent inspections and tests, are determined to be non-conforming.

2. If, on the basis of the visual inspection specified in Paragraph 9.02.B.1, the Goods appear to comply with the requirements of the Procurement Task Order Documents as to quantities and condition, then within 10 days of delivery Buyer shall issue to Seller Buyer's acknowledgment of the receipt of Goods.

C. *Final Inspection*

1. After all of the Goods have been incorporated into the Project, tested in accordance with such testing requirements as are specified, and are functioning as required, and Seller has performed and completed all Special Services, Buyer will make a final inspection.

2. If, on the basis of the final inspection, Buyer determines that the Goods and Special Services are conforming, Buyer's notice thereof will constitute Buyer's acceptance of the Goods and Special Services, subject to any limitations stated in the notice.

3. If, on the basis of the final inspection, the Goods and Special Services are non-conforming, Buyer will identify the non-conformity in writing.

9.03 *Non-Conforming Goods and Special Services*

A. If, on the basis of inspections and testing prior to delivery, the Goods and Special Services are found to be non-conforming, or if at any time after Buyer has acknowledged receipt of delivery and before the expiration of the correction period described in Paragraph 9.04, Buyer determines that the Goods and Special Services are non-conforming, then Seller shall promptly, without cost to Buyer and in response to written instructions from Buyer, either correct such non-conforming Goods and Special Services, or, if Goods are rejected by Buyer, remove and replace the non-conforming Goods with conforming Goods, including all work required for reinstallation.

B. *Buyer's Rejection of Non-Conforming Goods*

1. If Buyer elects to reject the Goods in whole or in part, Buyer's notice to Seller will describe in sufficient detail the non-conforming aspect of the Goods. If Goods have been

delivered to Buyer, Seller shall promptly, and within the Procurement Task Order Times, remove and replace the rejected Goods.

2. Seller shall bear all costs, losses and damages attributable to the removal, replacement, reinspection, and retesting of the non-conforming Goods.

3. Upon rejection of the Goods, Buyer retains a security interest in the Goods to the extent of any payments made and expenses incurred in their testing and inspection.

C. *Buyer's Rejection of Non-Conforming Special Services*

1. If at any time Buyer elects to reject the Special Services in whole or in part, Buyer's notice to Seller will describe in sufficient detail the non-conforming aspect of the Special Services.

2. Seller shall promptly provide conforming Special Services acceptable to Buyer.

3. If Seller fails to provide conforming Special Services, Buyer may remove the Special Services from the scope of the Procurement Task Order, and equitably reduce the Procurement Task Order Price.

D. *Remedying Non-Conforming Goods*: If Buyer elects to permit the Seller to modify the Goods to correct the non-conformance, then Seller shall promptly provide a schedule for such modifications and shall make the Goods conforming within a reasonable time.

E. *Buyer's Acceptance of Non-Conforming Goods*: Instead of requiring correction or removal and replacement of non-conforming Goods discovered either before or after final payment, Buyer may accept the non-conforming Goods. Seller shall bear all reasonable costs, losses, and damages attributable to Buyer's evaluation of and determination to accept such non-conforming Goods.

F. *Seller Obligations*: Seller shall pay all claims, costs, losses, and damages, including but not limited to all fees and charges for re-inspection, retesting and for any engineers, architects, attorneys and other professionals, and all court or arbitration or other dispute resolution costs arising out of or relating to the non-conforming Goods and Special Services. Seller's obligations will include the costs of the correction or removal and replacement of the non-conforming Goods and the replacement of property of Buyer and others destroyed by the correction or removal and replacement of the non-conforming Goods, and obtaining conforming Special Services from others.

G. *Buyer's Rejection of Conforming Goods*: If Buyer asserts that Goods and Special Services are non-conforming and such Goods and Special Services are determined to be conforming, or if Buyer rejects as non-conforming Goods and Special Services that are later determined to be conforming, then Seller shall be entitled to reimbursement from Buyer of costs incurred by Seller in inspecting, testing, correcting, removing, or replacing the conforming Goods and Special Services, including but not limited to fees and charges of engineers, architects, attorneys and other professionals, and all court or arbitration or other dispute resolution costs associated with the incorrect assertion of non-conformance or rejection of conforming Goods and Special Services.

9.04 *Correction Period*

A. Seller's responsibility for correcting all non-conformities in the Goods and Special Services will extend for a period of one year after the acceptance of the Goods and Special Services in accordance with Paragraph 9.02.C.2.

B. Where non-conforming Goods and Services (and damage to other work resulting therefrom) have been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Goods and Services will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

C. Seller's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph may not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 10—ENGINEER'S STATUS

10.01 *Engineer's Role Defined*

A. Engineer will be Buyer's representative until assignment (if any) of the Procurement Task Order.

B. The duties and responsibilities and the limitations of authority of Engineer prior to assignment, if any, of the Procurement Task Order, are set forth in the Procurement Task Order Documents.

C. Engineer's responsibilities, if any, after an assignment (if any) of the Procurement Task Order, are set forth in the Procurement Agreement.

10.02 *Duties and Responsibilities; Authority; Limitations*

A. As set forth in Article 3, Engineer will be the initial interpreter of the Procurement Task Order Documents and judge of the acceptability of the Goods and Special Services, and will issue clarifications, interpretations, and decisions regarding such issues.

B. Acting on behalf of Buyer under the provisions of Article 9, Engineer has the authority to disapprove or reject Goods and Special Services that Engineer believes to be non-conforming. Engineer also has the authority to require special inspection or testing of the Goods or Special Services as provided in Paragraph 9.02, whether or not the Goods are fabricated or installed, or the Special Services are completed.

C. Engineer may authorize minor deviations or variations in the Procurement Task Order Documents by: 1) written approval of specific variations set forth in Shop Drawings when Seller has duly noted such variations as required in Paragraph 7.06.A.3, or 2) a Field Order.

D. As set forth in Article 12, Engineer will review Claims, and render decisions on Claims.

E. In rendering any interpretations, clarifications, reviews, decisions, disapprovals, acceptances, rejections, authorizations, and judgments, Engineer will not show partiality to Buyer or Seller. Engineer will not be liable to Buyer, Seller, or others in connection with any interpretations, clarifications, reviews, decisions, disapprovals, acceptances, rejections, authorizations, or judgments conducted or rendered by Engineer in good faith.

F. Engineer will not supervise, direct, control, or have authority over or be responsible for the means, methods, techniques, sequences, or procedures used by Seller to perform its obligations under this Procurement Task Order, or the safety precautions and programs incident thereto, or for any failure of Seller to comply with Laws and Regulations applicable to the performance of its obligations. Engineer will not be responsible for Seller's failure to furnish the Goods and Special Services in accordance with the Procurement Task Order Documents.

ARTICLE 11—CHANGES

11.01 *Amending and Supplementing the Procurement Task Order*

A. The Procurement Task Order may be amended or supplemented by a Change Order, a Change Directive, or a Field Order.

B. If an amendment or supplement to the Procurement Task Order includes a change in the Procurement Task Order Price or the Procurement Task Order Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Procurement Task Order that involve (1) the conformance or acceptability of the Goods and Special Services, (2) the design (as set forth in the Procurement Drawings, Procurement Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Buyer and Seller may amend other terms and conditions of the Procurement Task Order without the recommendation of the Engineer.

11.02 *Change Orders*

A. Buyer and Seller shall execute appropriate Change Orders covering:

1. Changes in Procurement Task Order Price or Procurement Task Order Times which are agreed to by the parties, including any undisputed sum or amount of time for Goods and Special Services furnished in accordance with a Change Directive;

2. Changes in Procurement Task Order Price resulting from a Buyer set-off, unless Seller has duly contested such set-off;

3. Changes in the Goods and Special Services which are: (a) ordered by Buyer pursuant to Paragraph 11.05, (b) required because of Buyer's acceptance of non-conforming Goods and Services under Paragraph 9.03 or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Goods and Special Services involves the design (as set forth in the Procurement Drawings, Procurement Specifications, or otherwise) or other engineering or technical matters; and

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Change Directive; Article 12, Claims; and similar provisions.

B. If Buyer or Seller refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Change Directives*

A. A Change Directive will not change the Procurement Task Order Price or the Procurement Task Order Times but is evidence that the parties expect that the modification ordered or

documented by a Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Change Directive's effect, if any, on the Procurement Task Order Price and Procurement Task Order Times; or, if negotiations are unsuccessful, by a determination under the terms of the Procurement Task Order Documents governing adjustments, expressly including Paragraph 11.08 regarding change of Procurement Task Order Price.

B. If Buyer has issued a Change Directive and Buyer or Seller believes that an adjustment in Procurement Task Order Times or Procurement Task Order Price is necessary, then such party shall submit a Claim seeking such an adjustment no later than 30 days after the completion of the Goods and Services set out in the Change Directive.

11.04 *Field Orders*

A. Engineer may authorize minor changes in the Goods and Services if the changes do not involve an adjustment in the Procurement Task Order Price or the Procurement Task Order Times and are compatible with the design concept as indicated by the Procurement Task Order Documents. Such changes will be accomplished by a Field Order and will be binding on Buyer and also on Seller, which shall perform the Goods and Special Services involved promptly.

B. If Seller believes that a Field Order justifies an adjustment in the Procurement Task Order Price or Procurement Task Order Times, then before proceeding with the Goods and Special Services at issue, Seller shall submit a Claim as provided herein.

11.05 *Buyer-Authorized Changes in the Goods and Special Services*

A. Without invalidating the Procurement Task Order and without notice to any surety, Buyer may, at any time or from time to time, order additions, deletions, or revisions in the Goods and Special Services. Changes involving the design (as set forth in the Procurement Drawings, Procurement Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Goods and Special Services may be accomplished by a Change Order, if Buyer and Seller have agreed as to the effect, if any, of the changes on Procurement Task Order Times or Procurement Task Order Price; or by a Change Directive. Upon receipt of any such document, Seller shall promptly proceed with the Goods and Special Services involved; or, in the case of a deletion in the Goods and Special Services, promptly cease activities with respect to such deletion. Added or revised Goods and Special Services must be performed under the applicable conditions of the Procurement Task Order Documents.

11.06 *Buyer's Contingency Allowance*

A. The Buyer's Contingency Allowance, if any such, is set forth in the Procurement Agreement, is for the sole use of Buyer to cover unanticipated costs.

B. If Buyer exercises its unilateral right to use all or a portion of the Buyer's Contingency Allowance, Buyer will issue a written directive that documents the costs to which the allowance is applied, Seller's entitlement to compensation, and the consequent reduction in such allowance.

C. Prior to final payment, the Total Price, as set forth in the Procurement Agreement, will be duly adjusted to account for any unused portion of the Buyer's Contingency Allowance.

D. The Procurement Agreement, Article 5, addresses the impact on Buyer's Contingency Allowance of an assignment of the Procurement Task Order.

11.07 *Unauthorized Changes in the Goods and Special Services*

A. Seller shall not be entitled to an increase in the Procurement Task Order Price or an extension of the Procurement Task Order Times with respect to any work performed that is not required by the Procurement Task Order Documents, as amended, modified, or supplemented.

11.08 *Change of Procurement Task Order Price*

A. The Procurement Task Order Price may only be changed by a Change Order. Any Claim for an adjustment of Procurement Task Order Price must comply with the provisions of Article 12.

B. An adjustment in the Procurement Task Order Price will be determined as follows:

1. For changes in Unit Price Goods and Special Services, by application of the unit prices to the quantities of the items involved;

2. To the extent the cost of the change is not covered by unit prices, then by a mutually agreed lump sum; or

3. To the extent the cost of the change is not covered by unit prices and the parties do not reach mutual agreement to a lump sum, then on the basis of documented costs plus a Seller's fee for overhead and profit of 15%.

11.09 *Change of Procurement Task Order Times*

A. The Procurement Task Order Times may only be changed by a Change Order. Any Claim for an adjustment in the Procurement Task Order Times must comply with the provisions of Article 12.

11.10 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Goods and Special Services or the provisions of the Procurement Task Order (including, but not limited to, Procurement Task Order Price or Procurement Task Order Times), the giving of any such notice will be Seller's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS, DISPUTES, AND DISPUTE RESOLUTION

12.01 *Claims*

A. The parties agree to endeavor to avoid or resolve Claims through direct, good faith discussions and negotiations whenever practicable. Such discussions and negotiations should at the outset address whether the parties mutually agree to suspend the Claims process, including the time periods established in this Paragraph 12.01; if so, a written record of such mutual agreement should be made and jointly executed.

B. Claimant shall deliver to Engineer and the other party to the Procurement Task Order written notice of each Claim within 15 days after the occurrence of the event giving rise to the Claim.

C. Claimant shall deliver written supporting data to Engineer and the other party within 45 days after such occurrence unless Engineer allows an additional period of time.

D. Engineer will review each such Claim and render a decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

E. If Engineer does not render a formal written decision on a Claim within the time stated in Paragraph 12.01.D., Engineer shall be deemed to have issued a decision denying the Claim in its entirety 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

F. The rendering of a decision by Engineer pursuant to this Paragraph 12.01 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment) will be a condition precedent to any exercise by Buyer or Seller of such rights or remedies as either may otherwise have under the Procurement Task Order Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter. If the exercise of such rights or remedies will imminently be time-barred, a party may take actions necessary to preserve such rights and remedies notwithstanding the lack of the condition precedent referred to in this paragraph.

G. If a submitted matter in question concerns terms and conditions of the Procurement Task Order Documents that do not involve (1) the performance or acceptability of Goods and Special Services under the Procurement Task Order Documents, (2) the design (as set forth in the Procurement Drawings, Procurement Specifications, Addenda, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Buyer and Seller that Engineer is unable to provide a decision or interpretation. If Buyer and Seller are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Paragraph 12.02.

H. Engineer's written decision on such Claim or a decision denying the Claim in its entirety that is deemed to have been issued pursuant to Paragraph 12.01, will be final and binding upon Buyer and Seller 30 days after it is issued unless within 30 days of issuance Buyer or Seller appeals Engineer's decision by initiating the mediation of such Claim in accordance with the dispute resolution procedures set forth in Paragraph 12.02.

I. If Article 12 has been amended to delete the mediation requirement, then Buyer or Seller may appeal Engineer's decision within 30 days of issuance by following the alternative dispute resolution process set forth in Article 12, as amended; or if no such alternative dispute resolution process has been set forth, Buyer or Seller may appeal Engineer's decision by 1) delivering to the other party within 30 days of the date of such decision a written notice of intent to submit the Claim to a court of competent jurisdiction, and 2) within 60 days after the date of such decision instituting a formal proceeding in a court of competent jurisdiction.

J. No Claim for an adjustment in Procurement Task Order Price or Procurement Task Order Times will be valid if not submitted in accordance with Article 12.

12.02 *Dispute Resolution Method*

A. Either Buyer or Seller may initiate the mediation of (1) any Claim decided in writing by Engineer under Paragraph 12.01 before such decision becomes final and binding, or (2) any other dispute between the parties, including but not limited to any dispute arising after final inspection of the Goods and Services. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective

Date of the Procurement Task Order. The request for mediation must be submitted in writing to the American Arbitration Association and the other party to the Procurement Task Order. Timely submission of the request will stay Engineer's decision from becoming final and binding.

B. Mediation is a condition precedent to seeking final dispute resolution under Paragraph 12.01.C. Buyer and Seller shall participate in the mediation process in good faith. The process must be concluded within 60 days of filing of the request. The date of termination of the mediation will be determined by application of the mediation rules referenced above.

C. If the mediation process does not result in resolution of the dispute, then Engineer's written Claim decision under Paragraph 12.01.D or a Claim denial pursuant to Paragraph 12.01.E becomes final and binding, or if applicable such other dispute is deemed resolved in favor of respondent, unless, within 30 days after termination of the mediation, Buyer or Seller:

1. elects in writing to invoke any final dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim or dispute to another final dispute resolution process, or

3. if no final dispute resolution process has been provided for in the Supplementary Conditions, delivers to the other party written notice of the intent to submit the Claim or dispute to a court of competent jurisdiction, and within 60 days of the termination of the mediation institutes such formal proceeding.

ARTICLE 13—PAYMENT

13.01 *Applications for Progress Payments*

A. Seller shall submit to Buyer for Engineer's review Applications for Payment filled out and signed by Seller and accompanied by such supporting documentation as is required by the Procurement Task Order Documents and also as Buyer or Engineer may reasonably require.

B. The timing and amounts of progress payments will be as stipulated in the Procurement Agreement.

C. Any Application for Payment that is based in whole or in part on the delivery of Goods must be accompanied by a bill of sale, invoice, or other documentation reasonably satisfactory to Buyer warranting that Buyer has rightfully received good title to the Goods from Seller and that, upon payment, the Goods will be free and clear of all liens. Such documentation will include releases and waivers from all parties with viable lien rights.

D. Buyer shall notify Seller promptly of any deficiency in the required documentation.

13.02 *Review of Applications for Progress Payments*

A. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Buyer, or return the Application to Seller indicating in writing Engineer's reasons for refusing to recommend payment.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Buyer, based on Engineer's observations of Seller's progress, as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

    a. the Goods and Special Services or other obligations of Seller have progressed to the point indicated;

    b. the quality of the Goods and Special Services or other obligations of Seller are generally in accordance with the Procurement Task Order Documents; and

    c. the conditions precedent to Seller being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Seller's progress.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

    a. inspections made to check the quality or the quantity of the Goods and Special Services or other obligations of Seller have been exhaustive, extended to every aspect of the Goods and Special Services or other obligations of Seller in progress, or involved detailed inspections of the Goods and Special Services or other obligations of Seller beyond the responsibilities specifically assigned to Engineer in the Procurement Task Order; or

    b. there may not be other matters or issues between the parties that might entitle Seller to be paid additionally by Buyer, or entitle Buyer to withhold payment to Seller.

4. Neither Engineer's review of Seller's progress for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

    a. to supervise, direct, or control the Seller's performance or furnishing of Goods and Special Services or other obligations of Seller; or

    b. for the means, methods, techniques, sequences, or procedures of construction, manufacturing, fabrication, installation, or shipping, or the safety precautions and programs incident thereto; or

    c. for Seller's failure to comply with Laws and Regulations applicable to Seller's performance under the Procurement Task Order; or

    d. to make any examination to ascertain how or for what purposes Seller has used the money paid for the Procurement Task Order Price; or

    e. to determine that title to any of the Goods or component parts have passed to Buyer free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Buyer stated in Paragraph 13.02.A.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Buyer from loss because:

a. the Goods and Services are non-conforming, requiring correction or replacement;

b. the Procurement Task Order Price has been reduced by Change Orders;

c. Buyer has been required to correct non-conforming Goods and Special Services in accordance with Paragraph 9.03.C, or has accepted non-conforming Goods and Special Services pursuant to Paragraph 9.03.E; or

d. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Seller and therefore justify termination for cause under the Procurement Task Order Documents.

13.03 *Basis and Amount of Progress Payments*

A. The basis and amounts of the progress payments will be as provided in the Procurement Agreement, subject to the provisions of this Article 13 regarding reductions in payment.

13.04 *Suspension of or Reduction in Payment*

A. Buyer may temporarily cease making progress payments, or reduce the amount of a progress payment, even though recommended for payment by Engineer, under the following circumstances:

1. Buyer has reasonable grounds to conclude that Seller will not furnish the Goods or the Special Services in accordance with the Procurement Task Order Documents, and

2. Buyer has requested in writing assurances from Seller that the Goods and Special Services will be delivered or furnished in accordance with the Procurement Task Order Documents, and Seller has failed to provide adequate assurances within ten days of Buyer's written request.

3. In addition to any reductions in payment (set-offs) recommended by Engineer, Buyer is entitled to impose a set-off against payment based on any of the following:

a. claims have been made against Buyer based on Seller's conduct in the performance or furnishing of the Goods and Special Services, or has incurred costs, losses, or damages resulting from Seller's conduct in the performance or furnishing of the Goods and Special Services, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Seller has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Point of Destination or the worksite;

c. Seller has failed to provide and maintain required bonds or insurance;

d. Buyer has incurred extra charges or engineering costs related to Submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

e. the Goods and Special Services are non-conforming, requiring correction or replacement;

f. Buyer has been required to correct non-conforming Goods and Special Services, in accordance with Paragraph 9.03.C, or has accepted non-conforming Goods and Special Services pursuant to Paragraph 9.03.E;

g. the Procurement Task Order Price has been reduced by Change Orders;

h. an event that would constitute a default by Seller and therefore justify a termination for cause has occurred;

i. liquidated or other damages have accrued as a result of Seller's failure to achieve Milestones, Substantial Completion, or final completion of the Goods and Special Services; or

j. liens have been filed in connection with the Procurement Task Order, except where Seller has delivered a specific bond satisfactory to Buyer to secure the satisfaction and discharge of such liens.

B. If Buyer refuses to make payment of the full amount recommended by Engineer, Buyer will provide Seller and Engineer immediate written notice stating the reason for such action and promptly pay Seller any amount remaining after deduction of the amount withheld. Buyer shall promptly pay Seller the amount withheld when Seller corrects the reason for such action to Buyer's satisfaction.

13.05 *Final Payment*

A. After Seller has corrected all non-conformities to the reasonable satisfaction of Buyer and Engineer and furnished all Special Services, Seller may submit its final Application for Payment following the procedures for progress payments.

B. The final Application for Payment will be accompanied by all documentation called for in the Procurement Task Order Documents (including but not limited to all final operations and maintenance manuals, and any special warranties), a list of all unsettled Claims, and the written consent of surety to the making of final payment.

C. If, on the basis of final inspection and the review of the final Application for Payment and accompanying documentation, Engineer is reasonably satisfied that Seller has furnished the Goods and Special Services in accordance with the Procurement Task Order Documents, and that Seller has fulfilled all other obligations under the Procurement Task Order Documents, then Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment subject to the provisions of Paragraph 13.02, and present the final Application for Payment to Buyer. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Buyer from loss for the reasons stated in Paragraph 13.02.

D. If Engineer does not recommend final payment, Engineer will return the final Application for Payment to Seller, indicating the reasons for refusing to recommend final payment, in which case Seller shall make the necessary corrections and resubmit the final Application for Payment.

E. In support of its recommendation of final payment Engineer will also give written notice to Buyer and Seller that the Goods and Special Services are acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 13.06.

F. If the final Application for Payment and accompanying documentation are appropriate as to form and substance, Buyer shall, within 30 days after receipt thereof, pay Seller the amount recommended by Engineer, less any sum Buyer is entitled to set off against Engineer's recommendation, pursuant to the provisions of Paragraph 13.04.

G. Buyer will not make final payment, or return or release included retainage (if any) at any time, unless Seller submits written consent of the surety to such payment, return, or release.

13.06 *Waiver of Claims*

A. By making final payment, Buyer waives its claim or right to liquidated damages or other damages for late completion by Seller, except as set forth in an outstanding Claim, appeal, set-off, or express reservation of rights by Buyer. Buyer reserves all other claims or rights after final payment.

B. The acceptance of final payment by Seller will constitute a waiver by Seller of all claims and rights against Buyer other than those pending matters that have been duly submitted or appealed under the provisions of Article 12.

ARTICLE 14—CANCELLATION, SUSPENSION, AND TERMINATION

14.01 *Cancellation*

A. Buyer has the right to cancel the Procurement Task Order, without cause, at any time prior to delivery of the Goods by written notice. Cancellation pursuant to the terms of this paragraph will not constitute a breach of contract by Buyer. Upon cancellation:

1. Buyer shall pay Seller for the direct costs incurred in producing any Goods that Seller has specially manufactured for the Project, plus a fair and reasonable amount for overhead and profit.

2. For Goods that are not specially manufactured for the Project, Seller shall be entitled to a restocking charge of 10 percent of the unpaid Procurement Task Order Price of such Goods.

14.02 *Suspension of Performance by Buyer*

A. Buyer has the right to suspend performance of the Procurement Task Order for up to 90 days, without cause, by written notice. Upon suspension under this paragraph, Seller shall be entitled to an increase in the Procurement Task Order Times and Procurement Task Order Price caused by the suspension, provided that performance would not have been suspended or delayed for causes attributable to Seller.

14.03 *Suspension of Performance by Seller*

A. Seller may suspend the furnishing of the Goods and Special Services only under the following circumstance:

1. Seller has reasonable grounds to conclude that Buyer will not perform its future payment obligations under the Procurement Task Order; and

2. Seller has requested in writing assurances from Buyer that future payments will be made in accordance with the Procurement Task Order, and Buyer has failed to provide such assurances within ten days of Seller's written request.

14.04 *Breach and Termination*

A. *Buyer's Breach*

1. Seller shall have the right to terminate the Procurement Task Order for cause by declaring a breach if Buyer fails to comply with any material provision of the

Procurement Task Order. Upon termination, Seller shall be entitled to all remedies provided by Laws and Regulations.

2. If Seller believes Buyer is in breach of its obligations under the Procurement Task Order, Seller shall provide Buyer with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach has occurred. Buyer shall have 7 days from receipt of the written notice declaring the breach (or such longer period of time as Seller may grant in writing) within which to cure or to proceed diligently to cure such alleged breach.

B. *Seller's Breach*

1. Buyer may terminate Seller's right to perform the Procurement Task Order for cause by declaring a breach should Seller fail to comply with any material provision of the Procurement Task Order Documents. Upon termination, Buyer shall be entitled to all remedies provided by Laws and Regulations.

2. In the event Buyer believes Seller is in breach of its obligations under the Procurement Task Order, Buyer shall provide Seller with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach has occurred. Seller shall have 7 days from receipt of the written notice declaring the breach (or such longer period of time as Buyer may grant in writing) within which to cure or to proceed diligently to cure such alleged breach.

3. If and to the extent that Seller has provided a performance bond under the provisions of Paragraph 5.01, the notice and cure procedures of that bond, if any, will supersede the notice and cure procedures of Paragraph 14.04.B.2.

ARTICLE 15—MISCELLANEOUS

15.01 *Giving Notice*

A. Whenever any provision of the Procurement Task Order requires the giving of written notice to Buyer, Seller, or Engineer, it will be deemed to have been validly given if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

15.02 *Controlling Law*

A. This Procurement Task Order is to be governed by the law of the state in which the Goods are to be installed.

B. In the case of any conflict between the express terms of this Procurement Task Order and the Uniform Commercial Code, as adopted in the state whose law governs, it is the intent of the parties that the express terms of this Procurement Task Order will apply.

15.03 *Computation of Time*

A. When any period of time is referred to in the Procurement Task Order by number of days, it will be computed to exclude the first and include the last day of such period. If the last day

of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

15.04 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Procurement Task Order, and the provisions of this paragraph will be as effective as if repeated specifically in the Procurement Task Order in connection with each particular duty, obligation, right, and remedy to which they apply.

15.05 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Procurement Task Order, as well as all continuing obligations indicated in the Procurement Task Order, will survive final payment, completion, and acceptance of the Goods and Special Services or termination or completion of the Procurement Task Order or of the services of Seller.

15.06 *Entire Agreement*

A. Buyer and Seller agree that this Procurement Task Order is the complete and final agreement between them, and supersedes all prior negotiations, representations, or agreements, either written or oral. This Procurement Task Order may not be altered, modified, or amended except in writing signed by an authorized representative of both parties.

15.07 *No Waiver*

A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Procurement Task Order.

15.08 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

15.09 *Successors and Assigns*

A. Buyer and Seller each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Procurement Task Order.

15.10 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Seller for any claims, costs, losses, or damages sustained by Seller on or in connection with any other project or anticipated project.

15.11 *Assignment of Task Order*

A. Unless expressly agreed to elsewhere in the Task Order, no assignment by a party to this Task Order of any rights under or interests in the Task Order will be binding on the other party

without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Task Order.

15.12 *Severability*

A. Any provision of this Task Order which shall prove to be invalid, void or illegal shall in no way affect, impair or invalidate any other provision hereof, and such remaining provisions shall remain in full force and effect.

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SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY

A. Requirements for the submittal of information that will enable determination of whether the Contractor's proposed materials, equipment or methods of work are in general conformance to the design concept and in compliance with the Contract Documents.

B. Furnish drawings, specifications, descriptive data, certificates, samples, test results, methods, schedules, manufacturer's installation instructions and other information as indicated.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 99 00 – Reference Forms

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the materials and equipment incorporated into the Work, or the methods of performing the Work shall be as described in the accepted submittals.

B. Verify that all features of all products conform to the specified requirements. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment that are being submitted for review. Extraneous materials shall be crossed out or otherwise obliterated.

C. Coordinate submittals among subcontractors and suppliers. Ensure that there is no conflict with other submittals and notify the Engineer in each case where this submittal may affect the work of another contractor or the Owner, including those submittals complying with unit responsibility requirements specified in applicable technical sections.

D. Coordinate submittals with the Work so that work will not be delayed. Coordinate and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another. No extension of time will be allowed because of failure to properly schedule submittals.

E. Do not proceed with work related to a submittal until the submittal process is complete and the submittal has received a response "No Exceptions Taken" or "Make Corrections Noted."

F. Certify on each submittal document that the Contractor has reviewed the submittal, verified field conditions, and complied with the contract documents.

1. Include a copy of the specification section with addendum updates, all referenced and applicable sections, and each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements.

a. Use check marks (✓) to denote full compliance with a paragraph as a whole.

b. If deviations from the specifications are indicated and therefore requested by the Contractor, underline each deviation, and denote by a number in the margin to the right of the identified paragraph.

c. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications.

d. Include a detailed, written justification for each deviation.

2. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

1.04 REVIEW COSTS

A. The Owner's cost for review of submittals for the same proposed materials, equipment or work will be apportioned as follows:

1. The cost of review of the initial submittal and the first revised submittal will be borne by the Owner.

2. The cost to review all additional revised submittals after the first revised submittal will be charged to the Contractor. The cost of review shall include, without limitation, administrative, design and engineering activities directly related to review of submittals.

1.05 SUBMITTAL INDEX

A. Within 30 days of the Notice to proceed, submit a list, by specification section, of all submittals to be submitted.

B. Update and resubmit the submittal index on a monthly basis where additional submittals are identified, or as necessary

1.06 CATEGORIES OF SUBMITTALS

A. General

1. Submittals fall into two general categories;

a. Submittals for review and comment require action by the Engineer.

b. Submittals that are primarily for information only do not require Engineer's approval.

B. Submittals for Review and Comment

1. Transmit submittals for review and comment to the Engineer. The Engineer will review the submittal for compliance with the Contract requirements and will provide written comments regarding acceptability.

C. Submittals for Information Only

1. Where specified, furnish submittals to the Engineer for information only. The Engineer may, at the Engineer's option, review, and comment on any product data.

2. Incomplete or inadequate product data will be returned to the Contractor for resubmittal.

1.07 TRANSMITTAL PROCEDURES

A. General

1. Transmit submittals regarding material and equipment under cover of a Shop Drawing/Transmittal Form See Section 01 99 00.

2. Use a separate form for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required.

3. Identify submittal documents common to more than one piece of equipment with all the appropriate equipment numbers.

4. Make submittals for various items with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.

5. Assign a unique sequential number on the transmittal form accompanying each item submitted.

a. Use the following format for original submittal numbers: "XXX"; where "XXX" is the sequential number assigned by the Contractor.

b. Use the following format for resubmittals: "XXX-Y"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals, i.e., A, B, or C being the 1st, 2nd, and 3rd resubmittals, respectively. Submittal 25B, for example, is the second resubmittal of submittal 25.

B. Electronic Submittals

1. Electronic submittals are preferred except as otherwise indicated.

2. Prepare electronic submittals and Shop Drawings in electronic (*.pdf) format including half-sized and full-sized drawings, catalog information and other required submittal information.

3. Break down submittals that are larger than 10 megabytes into smaller sections, using logical division points to create sections.

4. Electronically bookmark electronic submittals greater than 30 pages in length by major submittal section to facilitate ease of navigation.

C. Paper copy submittals are not an acceptable alternative to electronic submittals except for samples.

D. Deviation from Contract

1. If the Contractor proposes to provide material, equipment, or method of work that deviates from the project manual, so indicate under "Proposed Deviations" on the transmittal form accompanying the submittal copies.

E. Submittal Completeness

1. Submittals that do not have all the information required to be submitted, including deviations, are not acceptable and will be returned without review.

1.08 SUBMITTAL CONTENT

A. Prepare submittals in compliance with individual Specification Sections and as indicated herein.

B. Shop Drawings:

1. Develop project-specific, scaled drawings to fully identify materials and products that will be provided and their relationship to other products that will be furnished and installed.

2. Do not utilize reproductions of the Contract Documents as the basis for the submittal.

3. Identify products, assemblies, equipment, and systems.

4. Provide equipment identification numbers or tag numbers, wiring diagrams, and setting diagrams.

5. Identify critical dimensions.

C. Product Data:

1. Provide information necessary to demonstrate conformance with the specified requirements. Include performance curves, specifications, and wiring diagrams.

2. Product data may consist of manufacturer's standard catalog information and data sheets, marked to indicate the specific products that will be provided.

3. Provide supplemental information as necessary to fully demonstrate how products will be modified from the manufacture's standard products to meet the specification requirements.

D. Manufacturer's Instructions: Written or published information that establishes the manufacturer's recommendations, guidelines and procedures for handling and installation of products, equipment, and assemblies.

E. Samples: Mount, display or package samples in a manner that will facilitate review and establish workmanship and quality of materials.

1.09 SUBMITTAL REQUIREMENTS

A. When the Contract Documents require a submittal, submit the specified information as follows:

1. Submittals for Review and Comment:

a. Electronic Submittal: Submit one electronic (*.pdf) submittal.

2. Submittals for Information Only:

a. Electronic Submittal: Submit one electronic (*.pdf) submittal.

1.10 REVIEW PROCEDURE

A. General

1. The Engineer will review submittals within the processing time identified in paragraph “Processing Time” and return:

a. Electronic Submittal – a signed submittal response document, in (*.pdf) format.

b. Paper Copy Submittal – Two marked up copies of the submitted copies. The reproducible original will be retained by the Engineer.

B. Submittals for Review and Comment

1. The returned submittal will indicate one of the following actions:

a. "NO EXCEPTIONS TAKEN" – The material, equipment or work method complies with the project manual.

b. "MAKE CORRECTIONS NOTED" – Limited corrections are required.

1) Provide a corrected copy where:

a) The information is to be included in the O&M data.

b) If requested by the Engineer.

c. "AMEND AND RESUBMIT" – The submittal is insufficient or contains incorrect data.

d. "REJECTED – SEE REMARKS" – The material, equipment, or work method does not comply with the project manual. Submittals with deviations that have not been identified clearly may be rejected.

2. For submittals marked "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED.

a. The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with any noted corrections.

3. For submittals marked "AMEND AND RESUBMIT" or "REJECTED – SEE REMARKS"

a. Contractor shall provide a typed letter responding to each of the Engineer’s review comments with each resubmittal.

b. Except at its own risk, the Contractor shall not undertake the work covered by such submittals until a new submittal is submitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

C. Submittals for Information Only

1. The returned submittal will indicate ACCEPTED FOR RECORD” if the submittal is complete and adequate.

2. Engineer may return comments on information submittals to identify concerns with what was submitted, in such case, Contractor shall address concerns in writing and return a revised submittal.

1.11 PROCESSING TIME

A. Prepare submittals and transmit to Engineer for review in sufficient time to allow Engineer's review; manufacture, fabrication or assembly of materials and systems; and shipping of material to the site in time for installation in accordance with the Contractor's schedule.

B. Engineer's time for review will begin upon receipt of a complete and comprehensive submittal containing all required information.

C. Engineer will review submitted information and transmit a response to Contractor within 21 days after receipt, subject to the following:

1. In some instances, review times for specific submittals may be modified by the individual specification Section.

2. Resubmittals will be subject to the same review time.

D. No adjustment of Contract Time or Contract Price will be allowed due to delays in the progress of the Work that are caused by rejected submittals and subsequent resubmittals.

1.12 EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS

A. The purpose of submittals is to demonstrate how Contractor intends to conform to the Contract Documents and design concepts. Engineer is entitled to rely upon the accuracy and completeness of designs, calculations, or certifications made by licensed professionals whether or not a stamp or seal is required by the Contract Documents.

B. The review procedure is based on the Contractor's guarantee that all features and characteristics not requiring submittals conform to the contract documents.

C. Review of contract drawings, methods of work, or information regarding materials or equipment the Contractor proposes to provide, does not relieve the Contractor of its responsibility for

1. Fulfilling the requirements of the Contract,

2. Proper operation of the equipment,

3. Correction of defective work

D. Reviews shall not be regarded as an assumption of risk or liability by the Engineer or the Owner.

E. A mark of "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED" means that the Owner has no objection to the Contractor, upon its own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.

F. The Engineer's review of shop drawings, samples, or test procedures will be only for conformance with design concepts and for compliance with information given in Contract Documents. The Engineer's review does not extend to:

1. Accuracy of dimensions, quantities, or performance of equipment and systems designed by Contractor.

2. Contractor's means, methods, techniques, sequences, or procedures except when specified, indicated on the Drawings, or required by Contract Documents.

3. Safety precautions or programs related to safety which shall remain the sole responsibility of the Contractor.

G. Review of a separate item does not indicate approval of the assembly in which the item functions.

1.13 SUBSTITUTIONS OR "OR EQUAL" ITEMS

A. Named or Sole Source Times

1. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function, and quality required.

2. Unless the name designated a "sole source" and/or is followed by words indicating that no substitution is permitted, materials, or equipment of other Suppliers may be accepted by Engineer. Follow the procedures in the General Conditions.

B. Modification due to Substitutions

1. All costs for redesign required by the implementation of the proposed substitute shall be borne by the Contractor.

2. All costs associated with incorporating a substitution into the project shall be borne by the Contractor.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

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SECTION 01 61 10

SEISMIC DESIGN REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The following primary and secondary structural system elements, non-structural components, and/or equipment supported by structures.

1. Mechanical, electrical, and plumbing equipment and appurtenances.

2. Un-buried Conduit, piping, cable trays, raceways, ducts, and similar systems.

3. Un-buried tanks and vessels (include contents), including support systems.

4. Storage racks, suspended ceilings, light fixtures, raised floors, partitions, storefronts, windows, louvers, architectural features and other non-structural components.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals

2. Section 05 50 01 – Anchor Bolts and Anchoring Devices

1.03 REFERENCES

A. Oregon Structural Specialty Code (OSSC), current governing edition.

1.04 DEFINITIONS

A. Engineer of Record: The Engineer responsible for the preparation of Contract Documents.

B. Specialty Engineer: Structural or Civil Engineer provided by the Contractor licensed in the State where the project is being built responsible for specific elements of the primary structural system, the secondary structural system, non-structural elements and/or equipment supported by structures.

1.05 GENERAL DESIGN REQUIREMENTS

A. The Contractor is responsible for producing designs that resist the total seismic forces in accordance with the seismic design criteria.

B. The Contractor is responsible for coordinating between the Engineer of Record and the Specialty Engineer.

C. The seismic design for non-structural components and equipment shall be in accordance with the OSSC Chapter 16, and the required coefficients and factors for determining the total design seismic forces are provided in the Seismic Design Criteria in Paragraph E below.

D. Coordinate the layout so that adequate space is provided between items for relative motion. Provide additional supports and restraints between items of different systems when necessary to prevent seismic impacts or interaction.

E. Seismic forces shall be determined in accordance with the following seismic design criteria:

1. Site-Specific Spectral Response Coefficients

   a. Short Period Mapped Maximum Considered Earthquake, 5 Percent Damped: S_S=0.63g

   b. Short Period Mapped Maximum Considered Earthquake, 5 Percent Damped: S_1=0.34g

   c. Short Period Design Spectral Response Acceleration, 5 percent Damped: S_{DS} = 0.42

   d. 1 Second Period Design Spectral Response Acceleration, 5 percent Damped: S_{D1} = 0.23

2. Site Class: B

3. Seismic Design Category: D, unless noted otherwise

4. Risk Category: III, unless noted otherwise

5. Component Importance Factor, Ip:

   a. Mechanical and Electrical Equipment: Use 1.0.

   b. Tanks and Tank Anchorage: Use 1.0.

   c. Components that contain hazardous materials: Use 1.5.

   d. Components that are required for life safety: Use 1.5.

   e. Components that must remain functional after an earthquake, such as fire protection sprinkler systems and egress stairways: Use 1.5.

6. Do not use more than 60 percent of the weight of tanks and mechanical and electrical equipment for designing anchors for resisting overturning due to seismic forces.

7. Consider both conditions of tanks being either empty or full for designing anchors for seismic forces.

8. Do not use friction to resist sliding due to seismic forces.

1.06 DESIGN REQUIREMENTS FOR PIPING, CONDUIT, AND DUCTS

A. The Contractor is responsible for producing designs for support of piping, conduit, duct or other systems to resist total seismic forces based on the seismic design criteria coefficients specified above, unless shown on the Contract Documents. Except where the technical specifications give specific exemption from resistance of seismic forces, all supports shall be designed to meet seismic criteria.

B. Where possible, pipes, conduit, and their connections shall be constructed of ductile materials (e.g., copper, ductile iron, steel or aluminum and brazed, welded or screwed connections). Pipes, conduits and their connections, constructed of nonductile materials (e.g., cast iron, no-hub pipe and plastic), shall have the brace spacing reduced to one-half of the spacing allowed for ductile material.

C. Seismic restraints may be omitted for the following conditions, where flexible connections are provided between components and the associated ductwork, piping and conduit:

1. Where the nominal pipe size is 1 in. or less.

2. Piping, conduit or ducts suspended by individual hangers 12 inches or less in length from the top of the component to the bottom of the structural support. Where rod hangers are used, they shall be equipped with swivels.

3. Air-handling ducts less than 6 square feet in cross-sectional area.

4. See the CBC for additional requirements related to the omitting of seismic bracing.

D. All trapeze assemblies supporting pipes, ducts and conduit shall be braced to resist the total seismic forces considering the weight of the elements on the trapeze. Pipes, ducts and conduit supported by a trapeze where none of those elements would individually be braced need not be braced if connections to the pipe/conduit/ductwork or directional changes do not restrict the movement of the trapeze. If this flexibility is not provided, bracing will be required when the aggregate weight of the pipes and conduit exceed 10 pounds/foot. The weight shall be determined assuming all pipes and conduit are filled with water.

E. As an alternative to designing the supports and anchorage, where an approved national standard provides a basis for the earthquake-resistant design, submit standard, data, and details for piping, conduit, duct or other systems:

1. For ductwork, mechanical piping, process piping and electrical conduits, follow Guidelines for Seismic Restraints of Mechanical Systems by SMACNA modified as follows:

a. Seismically brace piping regardless of size or location. Provide transverse braces at all changes in direction and at the end of all pipe runs. Space transverse braces not more than 20 feet apart. Provide longitudinal braces at 40-foot centers.

b. Seismically brace all ductwork regardless of size or location. Provide transverse braces at all changes in direction and at each end of run. Space braces not over 20 feet apart. Provide longitudinal braces at 40-foot centers.

2. For fire protection systems, follow NFPA 13 modified as in Paragraph 1.b above. Ensure that no seismic interaction occurs with items of other systems.

1.07 DESIGN REQUIREMENTS FOR UNDERWATER ITEMS

A. To allow for water sloshing, design rigid items such as piping or equipment supports for twice the lateral force, computed as if the item were above water. Alternatively, include seismic forces due to hydrodynamic forces in the analysis.

B. Design flexible items to accommodate sloshing motions without damage to rigid machinery.

C. Provide retainers to hold items from falling and damaging rotating equipment below, if bolted connections will fail because of ground motion displacing the supports.

1.08 SUBMITTALS

A. Comply with Section 01 33 00.

B. Shop Drawings: Submit structural calculations and detailed drawings signed and sealed by a civil or structural engineer for the following listed elements and where required in Divisions 2 through 16 of the primary structural system and their attachments, the secondary structural system and their attachments, permanent non-structural components and their attachments, and the attachments and anchorage for all permanent equipment supported by the structures.

1. Electrical and Information Technology Equipment
2. Submersible Solids Handling Pumps and Piping Systems
3. Standby Generators
4. Suspended Ceilings

C. Structural calculations and detailed drawings shall be prepared by a Specialty Engineer licensed in the State where the project is being built.

D. Structural calculations and detailed drawings shall clearly show the total design seismic forces which will be transferred from the elements of the structural system, non-structural components, and/or equipment and their attachments to the primary structure.

E. The Engineer's review of items within a Specification Section cannot be completed until all related items have been coordinated and submitted for review.

F. Quality Assurance Submittals

1. Test Reports: Submit test reports for tension testing of anchors.
2. Where required in the equipment specifications in Divisions 2 through 16 submit certification that the equipment itself is designed to resist all internal seismic forces based on the seismic design criteria for the project.
3. Where required in the equipment specifications in Divisions 2 through 16, submit signed and sealed structural calculations and detailed drawings from a specialty Structural or Civil Engineer licensed in the State where the project is being built for the attachments and anchorage to the primary structure.
4. Where required in the equipment specifications in Divisions 2 through 16, submit certification that the attachments and anchorage are designed to resist all seismic forces based on the seismic design criteria for the project.

1.09 QUALITY ASSURANCE

A. Qualifications: The Contractor is responsible for submitting signed and sealed structural calculations and detailed drawings from a Specialty Structural or Civil Engineer licensed in the State where the project is being built.

B. Regulatory Requirements: Comply with the State of Oregon adopted and amended versions of Oregon Structural Specialty Code (OSSC) Chapter 16 - Earthquake Design plus clarifications and additions specified in this Section.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

A. Site Tests:

1. Tension testing of expansion or adhesive anchors utilized for anchorage shall be done in the presence of the special inspector and a report of the test results shall be submitted.

2. See Section 05 50 01 for additional requirements.

B. Inspection:

1. Provide special inspection for high strength bolting or bolts installed in concrete.

2. See Section 05 50 01 for additional requirements.

END OF SECTION

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SECTION 01 61 11

SEISMIC ANCHORAGE AND BRACING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for seismic anchorage and bracing for equipment, tanks and nonstructural components.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 01 61 10– Seismic Design Requirements
3. Section 05 50 01– Anchor Bolts and Anchoring Devices
4. Section 46 05 13 – General Requirements for Equipment
5. Section 46 05 14 – Equipment Mounting

1.03 AREAS OF DESIGN RESPONSIBILITY

A. The Screw Press Dewatering Equipment Manufacturer (Manufacturer) shall be responsible for designing all seismic attachments, braces, and anchors for tanks, mechanical equipment, piping, and electrical equipment included in their Scope of Work that weigh more than 20 pounds.

B. The Manufacturer may provide standard design calculations and details for their specific pieces of equipment as part of the submittal for that equipment. Project-specific design calculations and details need not be produced unless the Manufacturer does not already have standard designs already prepared.

1.04 REFERENCES

A. The following is a list of standards which may be referenced in this section.

1. International Code Council (ICC)
    a. International Building Code (IBC)
    b. Evaluation Service (ICC-ES) Reports and Legacy Reports
2. American Society of Civil Engineers (ASCE)
    a. ASCE 7, Minimum Design Loads for Building and Other Structures.
3. Oregon Structural Specialty Code (OSSC)

1.05 SUBMITTALS

A. Comply with Section 01 33 00.

B. Seismic Anchorage and Bracing Calculations

1. Submit manufacturer's engineered seismic hardware data and installation requirements.

2. Provide calculations for seismic attachments, braces and anchorages clearly showing the criteria used for the design. Calculations for anchorage of components shall be signed and sealed by a registered Professional Engineer.

C. Shop Drawings: Show details of seismic attachment assemblies including connection hardware, bracing, and anchor bolts.

1.06 DESIGN AND PERFORMANCE REQUIREMENTS

A. In accordance with IBC, tanks, mechanical and electrical components, and other elements of the Work that are permanently attached to structures shall be designed and constructed to transfer the component seismic forces specified in ASCE 7, Chapter 13 to the structure.

B. Seismic attachments, braces, and anchorages shall be designed in accordance with the provisions of the IBC and the site-specific seismic criteria in Section 01 61 10.

C. Comply with Sections 46 05 13 and 46 05 14.

1. Do not use more than 60 percent of the weight of tanks and mechanical and electrical equipment for designing anchors for resisting overturning due to seismic forces.

2. Do not use friction to resist sliding due to seismic forces.

D. In accordance with ASCE 7, the following are exempt from the requirements of this Section:

1. Mechanical and electrical components with a Component Importance Factor of = 1.0 that weigh 400 pounds or less, are mounted 4 feet or less above the adjacent finished floor elevation, and are provided with flexible connections between the components and any associated ductwork, piping, or conduit.

2. Mechanical and electrical components with a Component Importance Factor of = 1.0 that weigh 20 pounds or less, are mounted at any height, and are provided with flexible connections to attached ductwork, piping, and conduit.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Attachments and supports transferring seismic loads to the structure shall be constructed of materials and products suitable for the application and designed and constructed in accordance with the design criteria shown on the Drawings and nationally recognized standards.

B. Do not use powder driven fasteners and sleeve anchors for seismic attachments and anchorages where resistance to tension loads is required.

C. Anchor Bolts: In accordance with Section 05 50 01.

PART 3 - EXECUTION

3.01 GENERAL

A. Design seismic anchorage systems to provide restraint in all directions, for each component or system so anchored.

B. Anchor tall and narrow equipment such as motor control centers and electrical control panels at the base and within 12 inches from the top of the equipment.

C. Mechanical and electrical components shall not be attached to more than one element of a building structure at a single restraint location where such elements may respond differently during a seismic event. Such attachments shall also not be made across building expansion and contraction joints.

D. Provide and install seismic attachments and braces in accordance with the size and number of braces determined by the design calculations prepared by the Contractor.

E. Provide and install anchor bolts and concrete and masonry anchors for the anchorage of equipment in accordance with the bolt sizing, minimum embedment, and spacing requirements determined by the calculations prepared by the Contractor.

END OF SECTION

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SECTION 01 61 50

WIND DESIGN CRITERIA

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The following primary and secondary structural system elements, non-structural components, and/or equipment supported by structures.

1. Mechanical, electrical, and plumbing equipment and appurtenances.

2. Un-buried Conduit, piping, cable trays, raceways, ducts, and similar systems.

3. Un-buried tanks and vessels (include contents), including support systems.

B. Storage racks, suspended ceilings, light fixtures, raised floors, partitions, storefronts, windows, louvers, architectural features and other non-structural components.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals

1.03 REFERENCES

A. Oregon Structural Specialty Code (OSSC), current governing edition.

1.04 DEFINITIONS

A. Engineer of Record: The Engineer responsible for the preparation of Contract Documents.

B. Specialty Engineer: Structural or Civil Engineer provided by the Contractor licensed in the State where the project is being built responsible for specific elements of the primary structural system, the secondary structural system, non-structural elements and/or equipment supported by structures.

1.05 GENERAL DESIGN REQUIREMENTS

A. The Contractor is responsible for producing designs that resist the total wind forces in accordance with the wind design criteria.

B. The Contractor is responsible for coordinating between the Engineer of Record and the Specialty Engineer.

C. The wind design for non-structural components and equipment shall be in accordance with the OSSC Chapter 16, and the required coefficients and factors for determining the total design wind forces are provided in the Wind Design Criteria in Paragraph E below.

D. Coordinate the layout so that adequate space is provided between items for relative motion. Provide additional supports and restraints between items of different systems when necessary to prevent wind impacts or interaction.

E. Design in accordance with the requirements of the following:

1. Risk Category: III

2. Basic Wind Speed: V = 104 mph.

3. Wind Exposure Category: B

4. Wind Importance Factor: I = 1.0

1.06 SUBMITTALS

A. Comply with Section 01 33 00.

B. Shop Drawings: Submit structural calculations and detailed drawings signed and sealed by a civil or structural engineer for the following listed elements and where required in Divisions 2 through 16 of the primary structural system and their attachments, the secondary structural system and their attachments, permanent non-structural components and their attachments, and the attachments and anchorage for all permanent equipment supported by the structures.

1. Electrical and Information Technology Equipment

2. Standby Generators

C. Structural calculations and detailed drawings shall be prepared by a Specialty Engineer licensed in the State where the project is being built.

D. Structural calculations and detailed drawings shall clearly show the total design wind forces which will be transferred from the elements of the structural system, non-structural components, and/or equipment and their attachments to the primary structure.

E. The Engineer's review of items within a Specification Section cannot be completed until all related items have been coordinated and submitted for review.

F. Quality Assurance Submittals

1. Test Reports: Submit test reports for tension testing of anchors.

2. Where required in the equipment specifications in Divisions 2 through 16 submit certification that the equipment itself is designed to resist all internal wind forces based on the wind design criteria for the project.

3. Where required in the equipment specifications in Divisions 2 through 16, submit signed and sealed structural calculations and detailed drawings from a specialty Structural or Civil Engineer licensed in the State where the project is being built for the attachments and anchorage to the primary structure.

4. Where required in the equipment specifications in Divisions 2 through 16, submit certification that the attachments and anchorage are designed to resist all wind forces based on the wind design criteria for the project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 66 00

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Materials, equipment and products incorporated into the work.

1.02 MATERIAL AND EQUIPMENT REQUIREMENTS

A. Specified in individual technical specification Sections in Divisions 02 through 11.

B. Specifications are minimum requirements and manufacturers' standard products may require modifications to meet the specified requirements.

C. Provide products and equipment with all accessories, trim, finish, safety guards and other devices needed for a complete and operational installation.

D. Products to be supplied in quantity shall be the same product from a single source to provide standardization and interchangeability.

1.03 DEFINITIONS

A. Named Products: Items identified by manufacturer's product name and model number as indicated in the manufacturer's published product data.

B. Materials: Products that are shaped, cut, worked, finished or otherwise fabricated or installed to form a part of the Work.

C. Equipment: A product with working parts, whether motorized or manually operated, that requires connections such as wiring or piping.

1.04 PACKAGING AND MARKING

A. Equipment shall be protected against damage from moisture, dust, handling, or other cause during transport from manufacturer's premises to site. Each item or package shall be marked with the number unique to the specification reference covering the item.

B. Stiffeners shall be used where necessary to maintain shapes and to give rigidity. Parts of equipment shall be delivered in assembled or subassembled units where possible.

C. Bearing housings, vents and other types of openings shall be wrapped or otherwise sealed to prevent contamination by dust and dirt.

1.05 SHIPPING AND DELIVERY

A. Plan, order, coordinate and deliver materials and equipment in accordance with the construction schedule to avoid delays and conflicts with the Work.

B. Deliver anchor bolts and bolt templates sufficiently early to permit setting and placement in structural concrete.

C. Unload products in accordance with the manufacturer's handling instructions. Promptly inspect for completeness and evidence of damage during shipment.

1.06 HANDLING AND STORAGE

A. During the interval between the delivery of equipment to the site and installation, all equipment, unless otherwise specified, shall be stored in an enclosed space affording protection from weather, dust and mechanical damage and providing favorable temperature, humidity and ventilation conditions to ensure against equipment deterioration. Manufacturer's recommendations shall be adhered to in addition to these requirements.

B. Equipment and materials to be located outdoors may be stored outdoors if protected against moisture condensation. Equipment shall be stored at least 6 inches above ground. Temporary power shall be provided to energize space heaters or other heat sources for control of moisture condensation. Space heaters or other heat sources shall be energized without disturbing the sealed enclosure.

C. Fabricated products, pipe and pipe appurtenances shall be handled, stored off the ground on blocking or skids. Pipes with paint, tape coatings, linings or the like shall be stored to protect the coating or lining from physical damage or other deterioration. Pipes shipped with interior bracing shall have the bracing removed only when recommended by the pipe manufacturer.

D. Store loose granular products in well-drained area on a solid surface to prevent mixing with foreign matter. Cover products that are subject to erosion or deterioration with plastic sheeting.

E. Store electrical, instrumentation and control products in a water-tight enclosure to protect against damage from moisture, dust and corrosion.

1.07 PROTECTION OF EQUIPMENT AFTER INSTALLATION

A. After installation, protect equipment from damage from, including but not limited to, dust, abrasive particles, debris and dirt generated by the placement, chipping, sandblasting, cutting, finishing and grinding of new or existing concrete, terrazzo and metal; and from the fumes, particulate matter, and splatter from welding, brazing and painting of new or existing piping and equipment.

B. As a minimum, vacuum cleaning, blowers with filters, protective shielding, and other dust suppression methods will be required at all times to adequately protect all equipment.

C. When sandblasting or when finishing concrete, all equipment that may be affected by cement dust shall be completely covered. Electrical switchgear, substations and motor load centers shall not be installed until after all concrete work and sandblasting in those areas have been completed and accepted and the ventilation systems installed.

D. During painting operations, all grease fittings and similar openings shall be covered to prevent the entry of paint.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 INSPECTION

A. Prior to installation, inspect materials and equipment for signs of corrosion and other effects of storage. Do not install material or equipment showing such effects.

B. Remove damaged material from the site and expedite delivery of replacement material or equipment. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays that are within the Contractor's control.

3.02 INSTALLATION

A. Handle, install, connect, clean and adjust products in accordance with the manufacturer's instructions.

B. Fill lubricant reservoirs and grease bearings prior to starting equipment. Use lubricants recommended by the manufacturer of the equipment.

C. Recoat painted surfaces that are damaged prior to final acceptance of the Work.

END OF SECTION

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SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for Operation and Maintenance (O&M) manuals and related equipment data for incorporation into the Owner's asset management system.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 01 81 00 – Equipment and System Testing
3. Section 01 99 00 – Reference Forms

1.03 SUBMITTALS

A. Comply with Section 01 33 00.

B. Provide the following completed forms with each submittal (See Section 01 99 00)

1. Operational and Maintenance Information Transmittal Form
2. Equipment Record Form A and B
3. Asset Management Data Field Form
4. Spare Parts Record Form
5. Spare Parts Release Form

C. The Equipment Records Form and Asset Management Field Data Form shall be the initial pages of the manual.

D. Sixty days prior to the testing and startup of any equipment, as specified in Section 01 81 00, Equipment and System Testing, submit one electronic copy of the Preliminary Operation and Maintenance manuals. Identify copies as "Preliminary."

E. Owner will complete review of preliminary O&M manuals and deliver reviewcomments within 30 days of receipt.

F. Provide four hard copies and two electronic copies of the final O&M Manual.

1.04 OPERATION AND MAINTENANCE MANUAL

A. Operation and Maintenance Manuals shall contain all the information needed to operate, maintain and repair all systems and equipment and material provided in theProject. Group equipment and components by system, organized around unit processes shown in the process and instrumentation diagrams (P&IDs) and the control strategies. Match testing, training and commissioning systems as much as possible. The information provided shall include, but not be limited to, the following:

1. General: The names, addresses, and telephone numbers of the manufacturer, the nearest manufacturer's representative, and the manufacturer's nearest supplier

of equipment and parts. Include the manufacturer's web site information. Provide performance curves for allpumps.

2. Operating Instructions:

   a. Safety Precautions: List personnel hazards for equipment and listsafety precautions for all operating conditions.

   b. Operator Prestart: Provide requirements to set up and prepare each system for use.

   c. Start-up, Shutdown, and Post-Shutdown Procedures: Provide acontrol sequence for each of these operations.

   d. Normal Operations: Provide control diagrams; explain operation and control of systems and specific equipment. As applicable, provide baseline vibration, temperature, pressure, etc. readings.

   e. Emergency Operations: Provide emergency procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage. Include shutdown instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance on emergency operations of all utility systems including valve locations and portionsof systems controlled.

   f. Service Requirements: Provide instructions for services to be performed by the operator such as lubrication, adjustments, andinspection.

   g. Environmental Conditions: Provide a list of environmental conditions (temperature, humidity, and other relevant data) which are best suited for each product and describe conditions under which productshould not be allowed to run.

3. Preventive Maintenance:

   a. Lubrication Data: Provide a table showing recommended lubricants for specific temperature ranges and applications; provide charts with a schematic diagram showing lubrication points, recommended lubricants, and capacities; provide a lubrication schedule showing service interval frequency.

   b. Provide manufacturer's preventative maintenance schedule for routine inspections, tests, and adjustments required to ensure proper and economical operation and minimize repairs. Provide manufacturer's projection of preventive maintenance man-hours, by type of craft, on a daily, weekly, monthly, and annual basis.

   c. In addition, provide a customized maintenance schedule to be input into the Owner's asset management system using Maintenance Schedule (Section 01 99 00).The customized maintenance schedule shall include all preventive maintenance tasks identified in the preventive maintenance schedule specified above, listing tasks to be performed at specific calendar and usage intervals.

4. Corrective Maintenance:

   a. Troubleshooting Guides and Diagnostic Techniques: Provide step-by-step procedures to promptly isolate the cause of typical malfunctions.

Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

b. Wiring and Control Diagrams: Provide point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide acomplete and accurate depiction of the actual job-specific wiring and control work. On diagrams, number electrical and electronic wiring terminals identically to actual installation.

c. Maintenance and Repair Procedures: Provide instructions and list tools required to restore equipment to proper operational condition.

d. Removal and Replacement Instructions: Provide step-by-step procedures and list required tools and supplies for removal, replacement, disassembly, and assembly of components, subcomponents, and accessories. Provide tolerances, dimensions, settings, and adjustments required. Include a combination of text and illustrations.

e. Spare Parts and Supply Lists: Provide lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonably delays using Spare Parts Release Form (Section 01 99 00). Identify spare parts and supplies that require a long lead time.Provide list prices.

f. Corrective Maintenance: Provide manufacturer's projection of corrective maintenance man-hours by type of craft. Separately identify and tabulate corrective maintenance requiring equipment manufacturer’s participation.

5. Appendices:

a. Parts Identification: Identify each component, subcomponent, and accessory subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clearand legible illustrations, drawings, and exploded views to enable easyidentification. When illustrations omit the part numbers and description, cross reference the illustrated part to the listed part. Group parts by components, subcomponents, and accessories.

b. Training Requirements: Provide manufacturer’s information for usein Owner training.

c. Testing Equipment and Special Tool Information: Provide informationon required test equipment; provide information on special tools needed for the operation, maintenance, and repair.

B. Deliver electronic copies on CD, USB flash drive or upload into the electronic construction document control system.

1. Electronic O&M manuals shall be in searchable Adobe Acrobat pdf format.

2. Where scanned pages are used, each scanned page shall be provided with a bookmark and identified in the index. In addition, annotate each scanned page

identifying the content. For example, for a scan of a Special Warranty, insert an annotation in the file stating “Special Warranty Documentation, Page 1.”

3. Index each manual with hyperlinks and bookmarks to each section.

4. Consistently orient all diagrams, drawings, pictures and illustrations.

5. Where Revit 3D drawing equipment blocks have been provided by equipment manufacturers, include equipment blocks as part of the electronic O&M manuals.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION

SECTION 01 79 00

TRAINING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for training the Owner's personnel, by persons retained by the Contractor specifically for the purpose, in the proper operation and maintenance of the equipment and systems installed under this Contract.

B. Coordinate with the equipment suppliers for all training activities and provide additional labor, services, and materials as required to complete training.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals

2. Section 01 99 00 – Reference Forms

1.03 TRAINING SESSIONS

A. Where required by the detailed specifications, provide on-the-job training of the Owner's personnel, which will include plant operations personnel, mechanics, electricians, and electronics technicians.

B. The training sessions shall be conducted by qualified, experienced (2 years minimum), manufacturer's factory-trained representatives (not sales representatives) of the various equipment manufacturers.

C. Include instruction in both equipment operation and preventive maintenance.

D. Field training sessions shall take place at the project site. Classroom training facility will be provided at the site by the Owner.

1.04 TIMING OF TRAINING SESSIONS

A. Conduct training sessions in conjunction with the operational testing and commissioning periods.

B. Operation and maintenance manuals shall be approved and ready for distribution to the Owner's personnel at least 30 days prior to the date scheduled for the individual training session.

1.05 SUBMITTALS

A. The following information shall constitute the Contractor's training plan and be submitted to the Engineer in accordance with the provisions of Section 01 33 00.

1. Lesson plans for each training session to be conducted by the Contractor's representatives. In addition, training manuals, handouts, visual aids, and other reference materials shall be included.

2. Date, time, and subject of each training session and identity and qualifications of individuals to be conducting the training.

3. Training schedule. Concurrent classes will not be allowed.

B. Due to phased testing and start-up activities, Contractor may prepare separate submittals for individual equipment items and systems. The materials shall be reviewed and accepted by the Engineer no later than 3 weeks prior to delivery of the training.

PART 2 - PRODUCTS

2.01 LESSON PLANS

A. Formal written lesson plans shall be prepared for each training session. Lesson plans shall contain an outline of the material to be presented along with a description of visual aids to be utilized during the session.

B. Each lesson plan shall contain a time allocation for each subject.

C. Furnish ten copies of the training manuals, handouts, and reference materials and one copy of necessary visual aids at least 1 week prior to each training session. These materials shall remain the property of the Owner and shall be suitably bound for proper organization and easy reproduction.

2.02 FORMAT AND CONTENT

A. Each training session shall be comprised of time spent both in the classroom and at the specific location of the subject equipment or system.

B. Content is as described in PART 3.

2.03 VIDEO RECORDING

A. Record or retain the services of a commercial videotaping service to record, each training session. After taping, the material may be edited and supplemented with professionally produced graphics to provide a permanent record. Submit final digital training record to the City in electronic format.

PART 3 - EXECUTION

3.01 SCHEDULING TRAINING SESSIONS

A. Classes shall be scheduled such that classroom sessions are interspersed with field instruction in logical sequence. Consolidate short training sessions into combined sessions so that staff time is more efficiently used. The minimum combined session length should be 1.5 to 2 hours. The maximum single or combined session length shall be 4 hours. The Contractor shall arrange to have the training conducted on consecutive days, with no more than 4 hours of classes scheduled for any one day. Contractor shall provide two training sessions on each system, piece of equipment, or “topic”.

B. No training sessions shall be scheduled for Mondays or Fridays. The Contractor shall coordinate the scheduling of training sessions with the operations superintendent.

3.02 TRAINING CONTENT

A. The following services shall be provided for each item of equipment or system. Additional services shall be provided, where specifically required in individual specification sections.

a. At a minimum, classroom equipment training for operations personnel will include:

b. Using slides and drawings, discuss the equipment's specific location in the plant and an operational overview.

c. Purpose and plant function of the equipment.

d. A working knowledge of the operating theory of the equipment.

e. Start-up, shutdown, normal operation, and emergency operating procedures, including a discussion on system integration and electrical interlocks, if any.

f. Identify and discuss safety items and procedures.

g. Routine preventative maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components.

h. Operator detection, without test instruments, of specific equipment trouble symptoms.

i. Required equipment exercise procedures and intervals.

j. Routine disassembly and assembly of equipment if applicable (as judged by the City on a case-by-case basis) for purposes such as operator inspection of equipment.

2. At a minimum, hands-on equipment training for operations personnel will include:

   a. Identify location of equipment and review the purpose.

   b. Identifying piping and flow options.

   c. Identifying valves and their purpose.

   d. Identifying instrumentation:

      1) Location of primary element.

      2) Location of instrument readout.

      3) Discuss purpose, basic operation, and information interpretation.

   e. Discuss, demonstrate, and perform standard operating procedures and round checks.

   f. Discuss and perform the preventative maintenance activities.

   g. Discuss and perform start-up and shutdown procedures.

   h. Perform the required equipment exercise procedures.

   i. Perform routine disassembly and assembly of equipment if applicable.

   j. Identify and review safety items and perform safety procedures, if feasible.

3. Classroom equipment training for the maintenance and repair personnel will include:

   a. Theory of operation.

   b. Description and function of equipment.

   c. Start-up and shutdown procedures.

   d. Normal and major repair procedures.

e. Equipment inspection and troubleshooting procedures including the use of applicable test instruments and the “pass” and “no pass” test instrument readings.

f. Routine and long-term calibration procedures.

g. Safety procedures.

h. Preventive maintenance such as lubrication; normal maintenance such as belt, seal, and bearing replacement; and up to major repairs such as replacement of major equipment part(s) with the use of special tools, bridge cranes, welding jigs, etc.

4. Hands-on equipment training for maintenance and repair personnel shall include:

a. Locate and identify equipment components.

b. Review the equipment function and theory of operation.

c. Review normal repair procedures.

d. Perform start-up and shutdown procedures.

e. Review and perform the safety procedures.

f. Perform City approved practice maintenance and repair job(s), including mechanical and electrical adjustments and calibration, and troubleshooting equipment problems.

g. Review and use equipment manufacturers’ manuals in the hands-on training.

5. Manufacturer’s Instruction Certification Form

a. Provide a Manufacturer’s Instruction Certification using the Form from Division 01 99 00.

b. Circulate an attendance list at the end of the training for signature by the Owner’s staff in attendance. Append the attendance list to the Certification Form for submittal per Section 01 33 00.

END OF SECTION

SECTION 01 81 00

EQUIPMENT AND SYSTEM TESTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for the Contractor's testing of mechanical, electrical, and instrumentation equipment and systems provided under this Contract.

B. The requirements contained in this Section supplement, but do not supersede, specific testing requirements found elsewhere in the Contract Documents.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals

2. Section 01 99 00 – Reference Forms

1.03 COORDINATION

A. Coordinate with the equipment suppliers for functional and performance testing and facility startup. Minimum levels of on-site installation and testing assistance required of the equipment suppliers is described in separate Sections.

B. Coordinate the activities of subcontractors and equipment suppliers to implement the requirements of this Section.

1.04 SUBMITTALS

A. Prepare and submit in accordance with Section 01 33 00.

B. Independent Testing Labs: When testing by an independent laboratory is specified, provide credentials and certifications to demonstrate capabilities.

C. Test Instruments Calibration: Certification that test instruments used in the testing procedure have been calibrated to an acceptable and recognized standard.

D. Testing Schedule: For each piece of equipment or system, provide a testing schedule and updates as appropriate. Submit at least 20 working days prior to the scheduled start of testing. Confirm the test schedule, or provide an updated schedule 4 days prior to the start of testing.

E. Testing Plan: Describe step by step procedure that will be utilized to systematically test equipment and systems.

F. Test Results:

1. Factory Test Results: Results of equipment tests performed by the equipment supplier at the point of manufacture and prior to shipping the equipment to the site.

2. Results of the Pre-Operational Test.

3. Results of the Functional Test.

4. Results of the Operational and Performance Tests.

G. Testing Form

1. Section 01 99 00 contains a sample Instrumentation Data and Calibration Test Form showing the format and level of detail required for the documentation forms.

H. Manufacturer's Field Certification

1. Submit a Manufacturer's Installation Certification Form (Section 01 99 00) after the manufacturer's Field Representative has completed the specified field services and testing. Submit the certification prior to Manufacturer's Representative leaving the plant site.

1.05 DOCUMENTATION REQUIREMENTS

A. Develop and implement a records keeping system to document compliance with the requirements of this Section.

B. Document date of test, equipment number or system name, nature of test (performance or operational), test objectives, test results and test instruments used during the test. Provide signature spaces for the Engineer and the Contractor.

1.06 TEST PLANS

A. Develop test plans in cooperation with the equipment suppliers detailing the coordinated, systematic testing of each item of equipment and system provided under this Contract.

B. Make test plans specific to the item of equipment or system to be tested. Identify by specific equipment or tag number each device or control station to be manipulated, observed or tested during the test procedure and the specific results to be observed or obtained.

C. Identify the responsibility of subcontractors and suppliers who will participate in the tests and list the names of manufacturers' representatives to be present during the duration of the test.

D. Provide step-by-step procedures for testing control and electrical circuits to affirm that the circuit is properly identified and connected to the proper device.

E. Undertake performance tests in a manner that will duplicate the actual operating conditions that will be encountered.

1.07 TESTING SCHEDULE

A. Prepare a testing schedule setting forth the sequence contemplated for performing the test work. Identify the contemplated start date, duration of the test and completion of each test.

1.08 TEST RESULTS

A. Test results shall be within the tolerances set forth in the detailed specification sections of the Contract Documents. If no tolerances have been specified, test results shall conform to tolerances established by recognized industry practice.

B. Retesting: If any portion of the work should fail to fulfill the Contract requirements and is adjusted, altered, renewed, or replaced, tests on that portion, together with all other

portions of the work as are affected thereby, shall be repeated within reasonable time and in accordance with the specified conditions.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

A. The objective of the testing program is to demonstrate, to the Engineer's complete satisfaction, that the systems and equipment provided under this Contract meet the specified performance requirements.

B. Testing program also provides a base-line operating condition for the Owner to use in a preventative maintenance program.

C. Testing sequence consists of Pre-Operational Checkout, Functional Tests, Performance Testing and Operational Testing. These tests are required regardless of whether Factory Tests were conducted on the same piece of equipment or system.

D. Each item of mechanical, electrical, and instrumentation equipment installed under this Contract shall be tested by the Contractor to demonstrate compliance with the performance requirements of this project.

E. Provide labor, outside services, materials, test equipment and other items required to complete the specified testing and startup requirements. Furnish power, water chemicals, fuel, oil, grease and other materials needed to conduct the specified tests.

F. Install temporary valves, gauges, piping and other materials required to conduct the specified tests.

3.02 PRE-OPERATIONAL CHECKOUT

A. Pre-Operational Checkout shall be undertaken by the manufacturer's field representative.

B. Pre-Operational Checkout includes basic checks of the equipment installation prior to starting the equipment to determine if the equipment and related components have been correctly installed and is ready for starting.

C. Pre-Operational Checkout includes the following:

1. Alignment of equipment, shafts and shaft couplings, drives, belts and pulleys.
2. Filling and checking lubrication reservoirs.
3. Checking shaft seals, packing and seal lubrication system.
4. Manufacturer's recommendations for pre-start preparation.
5. Proper motor rotation
6. Circuit continuity testing, electrical testing, and instrumentation and control system testing in accordance with the requirements of Division 16.
7. Demonstrate operational controls function as intended.
8. Calibration and adjustment of electrical and instrumentation devices.

D. Verify tanks, pipes, conduits, vessels and equipment are clean and free of debris that may interfere with the testing or operation of the equipment. Remove debris prior to start of testing.

E. Following completion of the Pre-Operational Checkout, the manufacturer's field representative shall complete and sign a field certification form and submit to the Engineer.

3.03 FUNCTIONAL TESTS

A. After successful completion of the Pre-Operational Checkout, start individual items of equipment and systems and operate under simulated operating conditions to determine as nearly as possible whether the equipment and systems meet the requirements of these specifications.

B. Operate the equipment for a sufficient period of time to determine machine operating and characteristics, including noise, temperatures and vibration; to observe and document performance characteristics; and to permit initial adjustment of operating controls.

C. Obtain baseline operating data on all equipment with motors greater than 10 horsepower to include amperage draw, bearing temperatures, and vibration as required. This baseline data will be collected for the Owner to enter in their preventive maintenance system.

D. Post-Test Inspection: When Functional Tests have been completed, recheck equipment for proper alignment, unacceptably loose connections, unusual movement, or other indications of improper operating characteristics. Correct any deficiencies to the satisfaction of the Engineer.

E. Machines or devices which exhibit unusual or unacceptable operating characteristics shall be disassembled and inspected. Repair any defects found during the course of the inspection and identify and correct the cause of such defect. Replace specific parts, or the entire equipment item, to the complete satisfaction of the Engineer at no cost to the Owner.

3.04 OPERATIONAL AND PERFORMANCE TESTS

A. After successfully completing functional tests, conduct an operational test of each system to verify correct operation. During the operational test, conduct performance testing to verify that the system complies with the performance requirements contained in the individual equipment specifications.

B. Owner's operating personnel will fill process units and process systems with water and other process fluids to allow the Contractor to conduct the operational tests.

C. Upon completion of the filling operations, operate all parts of each system for a continuous, uninterrupted period of not less than 8 hours. During this period, the Contractor and shall undertake performance testing and shall monitor the characteristics of each machine according to manufacturer information and specifications and report any unusual conditions to the Engineer.

D. Undertake performance tests of mechanical, electrical, HVAC, and instrumentation equipment and systems to demonstrate and confirm compliance with the performance requirements specified in the individual equipment specifications.

E. Should the operational testing be halted for any reason related to the facilities constructed or the equipment furnished under this Contract, the operational testing program shall be repeated until the specified continuous period has been accomplished without interruption.

F. Following successful completion of the Operational Test, commissioning of the system may begin.

END OF SECTION

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SECTION 01 99 00

REFERENCE FORMS

The forms listed below and included in this Section are referenced from other Sections of the project manual. Contractor may submit equivalent forms for Owner's approval prior to use. If Owner does not approve substitute form, Contractor must use forms found in this Section. Owner will provide electronic files of prescribed forms to Contractor upon request.

Referenced In Section	Title of Form
01.78.23	Asset Management Data Field Form
01.78.23	Equipment Record Form - A
01.78.23	Equipment Record Form - B
09.96.00, 11.05.13, 41.12.13. 46.76.27	Extended Warranty
01.81.00	Instrumentation Data and Calibration Record Test Form
01.81.00, 41.12.13, 46.05.13, 46.33.33, 46.276.27	Manufacturer's Installation Certification
01.79.00, 41.12.13, 46.33.33	Manufacturer's Instruction Certification
11.05.13, 41.12.13, 46.33.33, 46.76.27	Motor Data Form
01.78.23	Operation and Maintenance Transmittal Form
01.78.23	Spare Parts Record
01.78.23	Spare Parts Release
01.33.00	Submittal Transmittal
41.12.13, 46.33.33, 46.76.27	Unit Responsibility Certificate

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ASSET MANAGEMENT DATA FIELD FORM:

Equipment Data Field	By Contractor	Required*	Input	Example
Equipment ID	X	1		P23DSLPCN403
Area	X	1		P23
System	X	1		DSL
Equip Type	X	1		PCN
Description	X	1		Digester #4 Recirculation Pump
Location	X	1		Digester Pump Room
Service Status	X	1		ACTV/ABDN/DLTD
Project Name	X	1		2015 Plant Expansion
Design Package	X	1		3
Size	X	1		30
Unit of Measure	X	1		HP
Manufacturer	X	1		Wemco Pumps
Model Number	X	1		Wem-omatic 30
Serial Number	X	1		234569
Subunit of		1		P23DIGTNK004
P&ID #	X	1		25.08
Elect. Drawing #	X	2		23E01
Instr. Drawing #	X	2		I-403
Other Drawing #'s		2		23P04
Normal Position		2		running
Operation Notes		2		run to recirculate Digester 4
Purchase Cost	X	1		$15634.00
Warranty Expires	X	1		11/30/2016
Manufactured Date	X	2		05/24/2014
Purchase Date	X	2		08/18/2015
Installed Date	X	1		11/30/2015
PLC Cabinet	X	2		CCR233
Motor Control Center	X	2		MCC235
MCC Bucket	X	2		4C
Power/Lighting Panel	X	2		L-239

Equipment Data Field	By Contractor	Required*	Input	Example
Panel Circuit Breaker	X	2		17
Motor/Oper: Make/Model	X	2		Baldor / Ecotech432
Specification Number	X	1		23 40 13
Submittal Number	X	1		43A
Former Equipment ID		2		P09DSLPCN003
In Criticality Model		1		Y/N
*1 – REQUIRED for ALL Equip. *2 – REQUIRED as Applicable				

EQUIPMENT RECORD FORM A (Electrical or Motorized Mechanical Equipment):

Equip. Description:		Equip. Loc.:	
Equip. No.	Shop Dwg. No.	Date Inst.:	Cost:
Mfgr.:		Mfgr Contact	
Mfgr. Address:			Phone:
Vendor :		Vendor Contact:	
Vendor Address:			Phone:

MAINTENANCE REQUIREMENTS	D	W	M	Q	S	A	Hours

Lubricants: Recommended	
Alternative:	
Misc. Notes:	

Recommended Spare Parts				Electrical Nameplate Data			
Part No.	Qty	Part Name	Cost	Equip			
				Make			
				Serial No.		Id. No.	
				Model No.		Frame No.	
				HP	V	Amp	Hz
				pH	RPM	SF	Duty
				Code	Ins. Cl.	DES	Type
				NEMA DES	C Amb.	Temp Rise	Rating
				Misc.			

Recommended Spare Parts				Mechanical Nameplate Data			
Part No.	Qty	Part Name	Cost	Equip			
				Make			
				Serial No.		Id. No.	
				Model No.		Frame No.	
				HP	V	Amp	Hz
				pH	RPM	SF	Duty
				Code	Ins. Cl.	DES	Type
				NEMA DES	C Amb.	Temp Rise	Rating
				Misc.			

EQUIPMENT RECORD FORM B (Electrical or Non-Motorized Mechanical Equipment):

Equip. Description:		Equip. Loc.:	
Equip. No.	Shop Dwg. No.	Date Inst.:	Cost:
Mfgr.:		Mfgr Contact	
Mfgr. Address:			Phone:
Vendor :		Vendor Contact:	
Vendor Address:			Phone:

MAINTENANCE REQUIREMENTS	D	W	M	Q	S	A	Hours

EXTENDED WARRANTY FORM

(For Equipment, Material, Process)

Extended Warranty For: Product Name

Specification Section No. _____

Product Manufacturer _____

Project: _____

Location: _____

We hereby guarantee the Product Name that we have constructed for a period of # of Years (#) year(s), as specified in the Section noted above, from Date, the date of acceptance of the work/substantial completion and the assumption of occupancy and beneficial use by the Name of Owner.

The following are excluded from the provisions of this warranty:

We agree that if any of the equipment, material, or process designated for Product Name should fail due to any reason other than improper maintenance or improper operation, or should any portion of the work fail to fulfill any of the requirements of the Specifications, we will, within ten days after written notice of such defects, commence to repair or replace the same together with any other work which may be damaged or displaced in so doing.

In the event of our failure to comply with the above mentioned conditions within a reasonable time after being notified, or should exigent circumstances require repairs or replacements to be made before we can be notified or respond to notification, we do hereby authorize the Name of Owner to proceed to have the defect repaired and made good at our expense, and we will pay the cost therefor upon demand.

The warranty provided herein shall not be in lieu of, but shall be in addition to any warranties or other obligations otherwise imposed by the Contract Documents and by law.

Manufacturer:	_____	Contractor:	_____
Signed:	_____	Signed:	_____
Title:	_____	Title:	_____
Date:	_____	Date:	_____
Phone:	_____	Phone:	_____
E-mail:	_____	E-mail:	_____

INSTRUMENTATION DATA AND CALIBRATION RECORD TEST FORM

Component Description _____

Component Tag Name _____

Manufacturer		Location	
Name	_____	Site	_____
Model	_____		_____
Serial #	_____	Equip	_____

	Range	Unit
Indicator Range		
Input Range		
Output Range		

General Notes
1) Attach Calibration Curves for dp Flowmeters
2) Include mounting elevations for level Instruments
3) All entries within solid box to be typed in prior to start of test

Designed Calibration			Measured Calibration		
Input Signal	Output	Eng. Value	Input	Output	Comments

Notes:

Tested by _____ (print name)

Signature _____

Date _____

Witnessed by _____ (print name)

Signature _____

Date _____

MANUFACTURER'S INSTALLATION CERTIFICATION FORM

Contract No: _____ Specification Section: _____

Equipment Name _____

Contractor: _____

Manufacturer of Equipment Item: _____

The undersigned manufacturer of the equipment item described above hereby certifies that he has checked the installation of the equipment and that the equipment, as specified in the project manual, has been provided in accordance with the manufacturer's recommendations and that the trial operation of the equipment item has been satisfactory.

Comments:

_____

_____

_____

_____

_____ _____

Date Manufacturer

_____

Signature of
Authorized Representative

_____ _____

Date Contractor

_____

Signature of
Authorized Representative

MANUFACTURER'S INSTRUCTION CERTIFICATION FORM

Contract No: _____ Specification Section: _____

Equipment Name: _____

Contractor: _____

Manufacturer of Equipment Item: _____

The undersigned manufacturer certifies that a service engineer has instructed the owner's staff in the proper maintenance and operation of the equipment designated herein.

Operations Check List (check appropriate spaces)

Start-up procedure reviewed	☐
Shutdown procedure reviewed	☐
Normal operation procedure reviewed	☐
Others:	
_____	☐
_____	☐

Maintenance Check List (check appropriate spaces)

Described normal oil changes (frequency)	☐
Described special tools required	☐
Described normal items to be reviewed for wear	☐
Described preventive maintenance instructions	☐
Described greasing frequency	☐
Others	
_____	☐
_____	☐

Manufacturer: _____

Date	Signature of Authorized Representative
Date	Signature of Owner's Representative
Date	Signature of Contractor's Representative

MOTOR DATA FORM

Equipment Name: _____ Equipment Number: _____

Site Location: _____

Nameplate Markings

Mfr _____ Mfr Model _____ Frame _____ HP _____

Volts _____ Phase _____ RPM _____ Service Factor _____

FLA _____ LRA _____ Freq _____ Amb temp rating _____ degrees C

Time rating _____ Design letter _____

(NEMA MG1-10.35) (NEMA MG-1.16)

KVA code letter _____ Insulation class _____

The following information is required for explosionproof motors only:

A. Approved by UL for installation in Class _____ , Div _____

B. UL frame temperature code _____ , Group _____ Atmosphere

(NEC Tables 500-2 and 500-2(b))

The following information is required for high efficiency motors only:

A. Guaranteed minimum efficiency at full load or NEMA efficiency index

(NEMA MG1-12.53b)

B. Nameplate or nominal efficiency _____

Data Not Necessarily Marked on Nameplate

Type of enclosure _____ Enclosure material _____

Temp rise _____ degrees C (NEMA MG1-12.41,42)

Space heater included? _____ Yes _____ No, if Yes _____ watts _____ volts

Type of motor winding overtemperature protection, if specified:

_____

Use the space below to provide additional information on other motor modifications, if specified:

_____

_____

_____

OPERATING AND MAINTENANCE INFORMATION TRANSMITTAL

Submittal Description: _____

Submittal No.	**# Copies:**
☐ 1st Submission	☐ Re-Submittal
Spec Section	

Owner:	**Routing**	**Date Sent**	**Date Received**
	Contractor/CM		
Project:	CM/Design Consultant		
	Design Consultant/CM		
Contractor:	CM/Contractor		

Supplier Name:	Supplier Review		Design Consultant Review	
Checklist	Satisfactory	N/A	Accept	Deficient
1. Table of Contents	☐	☐	☐	☐
2. Equipment Record Forms	☐	☐	☐	☐
3. Supplier/Vendor Contact Information	☐	☐	☐	☐
4. Safety Precautions	☐	☐	☐	☐
5. Operator Pre-Start	☐	☐	☐	☐
6. Start-up, Shutdown/Post-Shutdown Procedures	☐	☐	☐	☐
7. Normal Operations	☐	☐	☐	☐
8. Emergency Operations	☐	☐	☐	☐
9. Operator Service Requirements	☐	☐	☐	☐
10. Environmental Conditions	☐	☐	☐	☐
11. Lubrication Data	☐	☐	☐	☐
12. Preventative Maintenance Plan/Schedule	☐	☐	☐	☐
13. Troubleshooting Guide/Diagnostic Techniques	☐	☐	☐	☐
14. Wiring Diagrams and Control Diagrams	☐	☐	☐	☐
15. Maintenance and Repair Procedures	☐	☐	☐	☐
16. Removal and Replacement Procedures	☐	☐	☐	☐
17. Spare Parts and Supply List	☐	☐	☐	☐
18. Corrective Maintenance Man-hours	☐	☐	☐	☐
19. Parts Identification	☐	☐	☐	☐
20. Warranty Information	☐	☐	☐	☐
21. Personnel Training Requirements	☐	☐	☐	☐
22. Testing Equipment and Special Tool Information	☐	☐	☐	☐

Remarks:	

_____ (Contractor's Signature)

_____ (Supplier's Signature)

SPARE PARTS RECORD FORM

PROJECT			
DESIGN PACKAGE			
SPECIFICATION SECTION			
SPECIFICATION TITLE			
MFGR		MFGR CONTACT	
MFGR ADDRESS		MFGR PHONE	
VENDOR		VENDOR CONTACT	
VENDOR ADDRESS		VENDOR PHONE	

EQUIPMENT NUMBER(S):	EQUIPMENT NAME(S):

SPARE PARTS						
PART NO.	PART NAME	MFG	COST	LONG LEAD TIME*	QUANTITY	
					SPECIFIED	REC. BY MFG

*Long lead time = parts requiring more than 4 weeks from time of order to delivery.

SPARE PARTS RELEASE FORM

Design Package: _____

Project No: _____ Place of Delivery: _____ Date: _____

Pallet Number	Container Number	Spec Section	Equipment Number	Spare Part Description	Price

_____ _____

Signature of Contractor Date

_____ _____

Signature of Owner Date

cc: Maintenance Supervisor
Operations Supervisor

SUBMITTAL TRANSMITTAL

Submittal Description _____

Priority Level: ☐ Low ☐ Medium ☐ High ☐ **On Critical Path**

Submittal No.	
☐ 1st Submission	☐Re-Submittal
Spec Section	
Dwg/Detail No.	

Owner:	**Routing**	**Date Sent**	**Date Received**
Project Name:	Contractor/CM		
	CM/Design Consultant		
Contractor:	Design Consultant/CM		
	CM/Contractor		

We are sending you: ☐ Attached ☐ Under separate cover via _____

☐ Submittals for review and comment

☐ Product Data for information only _____

No. Copies	**Description**	**Manufacturer**	**Reviewer Action**	**Reviewer Initials**

The Action Designated Above is in Accordance with the Following Legend:

A – No Exceptions Taken
B – Make Corrections Noted
C – Amend and Resubmit
D – Rejected
E – Review not Required

CONTRACTOR: Must certify one of the following statements pertaining to the transmittal or submittal sent for review:

☐ As the General Contractor for this project we certify that the material or equipment contained in this submittal meets all the requirements, including coordination with all related work specified (no exceptions)

☐ As the General Contractor for this project we certify that the material or equipment contained in this submittal meets all the requirements specified except for the attached deviations.

Comments:

Certified by: _____
(Contractor's Signature)

SYSTEM OUTAGE REQUEST FORM

System to be Shutdown: _____ **SOR No.:** _____

Date of Shutdown: _____ Beginning at: _____ am/pm

Duration of Shutdown: _____ Critical Path Activity? ☐ yes ☐ no

Owner:		**Routing**	**Date Sent**	**Date Received**
Project:		Contractor/CM		
Contractor:		CM/Owner-Operations		

Regulatory Agency Notification Required? ☐ yes ☐ no Is a Dry Run Required? ☐ yes ☐ no

Combustible/Hazardous Gases Present? ☐ yes ☐ no Confined Space Entry? ☐ yes ☐ no

Describe work to be performed including detailed sequence of events, safety plan, protection of existing facilities, equipment to be used and contingency plan. Use additional sheets as necessary.

Will you require assistance from Owner Operations? ☐ yes ☐ no

Note: *Existing valves and controls shall be operated by Owner staff only*

Outage Contact Information	**Name of Person on Call/Duty**	**Home Phone**	**Cell Phone**
Contractor			
Construction Manager			
Owner Operations			
Design Consultant			

Additional Contractor Comments:

CM / Owner / Design Consultant Review Action

☐ SOR Acceptable with comments noted on attached.

☐ SOR Not Acceptable with reasons noted on attached. Re-Submittal is required.

Certified by: _____ (Contractor's Signature)

_____ (Construction Manager's Signature) _____ Date

Name of Owner

CERTIFICATE OF UNIT RESPONSIBILITY
For Specification Section

Section Number and Title

In accordance with the contract documents, the undersigned manufacturer accepts unit responsibility for all components of equipment furnished under specification Section Section #***. We hereby certify that these components are compatible and comprise a functional unit suitable for the specified performance and design requirements.***

Name of Corporation

Street Address

City, State and Zip Code

By: _____
Duly Authorized Official

Notary Public

Commission Expiration Date

Name

Title

Seal:

Date: _____

SECTION 05 50 01

ANCHOR BOLTS AND ANCHORING DEVICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Anchor bolts, concrete anchors, adhesive anchors, and other anchoring devices.

1.02 REFERENCED SECTIONS

A. The following Section is referenced in this Section

1. Section 01 33 00 – Submittals

1.03 SUBMITTALS

A. Comply with Section 01 33 00.

B. Product Data: Manufacturer's data for nuts, bolts, concrete anchors, chemical anchors and other fasteners.

C. Catalog data and ICC reports for each type of anchor bolt.

1.04 QUALITY ASSURANCE

A. For applications that require special inspection in accordance with building codes, coordinate the progress of the Work with the required inspection activities.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Unless otherwise specified or indicated on the Drawings, materials of construction for anchoring devices shall conform to the following:

1. Anchor bolts and other anchoring devices, nuts and washers installed indoors: Type 304 stainless steel.

2. Anchor bolts and other anchoring devices, nuts and washers installed outdoors or in locations exposed to wastewater: Type 316 stainless steel.

a. Locations exposed to wastewater includes:

1) Below tops of walls of water-containing structures.

2) Underside of roof, slab or walkways of enclosed water-containing structures.

3) Dry side of walls on water-containing structures.

2.02 CAST-IN-PLACE ANCHOR BOLTS

A. Locations for use of cast-in-place anchor bolts:

1. In locations indicated on the Drawings.

2. To anchor engine-driven equipment and equipment with motors 3 horsepower and larger.

B. Cast-in-Place Anchor Bolts

1. Material: Stainless steel conforming to ASTM A320.

2. Minimum Length of Bolt: As indicated on the Drawings. When not indicated, provide bolt length such that the length of the embedded anchor is at least 10 bolt diameters.

3. Embedded end of anchor bolts: Standard hex headed (hook or J bolts not allowed).

2.03 CONCRETE ANCHORS

A. Application: Not allowed in walls or floor slabs of water containing structures.

B. Concrete Anchors: Drilled in place wedge-type anchors with threaded stud body, stainless steel expansion clip, nut and washer.

C. Materials: Type 304 or Type 316 stainless steel, depending upon installed location.

D. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC193.

E. Manufacturers: One of the following or equal:

1. Hilti Kwik Bolt 3.

2. ITW Redhead, Trubolt Wedge Anchor.

3. Dewalt Fasteners, Power-Stud SD4 or SD6.

4. Simpson Strong Tie, Strong-Bolt 2 Wedge Anchors.

2.04 STUDS

A. Material: Conforming to ASTM A108 with 50,000 pounds per square inch minimum yield strength, and 60,000 pounds per square inch minimum tensile strength.

B. Manufacturers: One of the following or equal:

1. Nelson Stud Welding Company, S3L Shear Connectors or H4L Concrete Anchors.

2. Stud Welding Products, Headed Concrete Anchors and Shear Connectors or Concrete Anchors.

2.05 ADHESIVE ANCHORS

A. Applications: Use for bonding threaded rods and concrete reinforcing bars to hardened concrete and grouted cement masonry. Do not use in overhead applications, in chlorine gas environments, or where anchor may be exposed to machine oil or diesel oil.

B. Code Compliance: Test in accordance with, and comply with requirements of, ASTM E488 and ICC-ES AC58.

C. Materials

1. Epoxy Adhesive: Two component, injectable epoxy adhesive.

2. Concrete Reinforcing Bars: Grade 60.

3. Threaded Rods: Type 304 stainless steel all-thread rod conforming to ASTM F593.

D. Manufacturers: One of the following or equal:

1. Hilti HVA Adhesive Anchor System.
2. ITW Redhead G6+ Adhesive Anchoring System.
3. Dewalt Fasteners PE1000+ Epoxy Anchoring System.
4. Simpson Strong Tie, SET-XP Epoxy Adhesive.

PART 3 - EXECUTION

3.01 GENERAL ANCHORING REQUIREMENTS

A. Use equipment shop drawings, anchorage layout drawings, and anchor bolt layout templates to accurately position anchor bolts.

B. Install anchor bolts, concrete anchors and other anchoring devices with at least 2 threads projecting beyond the nut, but no more than 1/2-inch projecting beyond the nut.

C. Prior to installing nuts, coat threads of stainless steel bolts with material to prevent galling of threads.

1. Manufacturers: One of the following or equal:

a. Never Seez Compound Corporation, Never-Seez.

b. Oil Research, Inc., WLR No. 111.

D. Tighten nuts on anchor bolts, concrete anchors and other anchoring devices to the "snug-tight" condition, defined as tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary wrench.

3.02 CAST-IN-PLACE ANCHOR BOLTS

A. Do not use expansion type concrete anchors or adhesive anchors as substitution for cast-in-place anchor bolts.

B. Accurately place anchor bolts to be embedded in concrete within the formwork and perpendicular to surface from which they will project. Secure in correct position while concrete is placed.

C. Do not allow anchor bolts to touch reinforcing steel in water containing structures where the anchor bolts may come into contact with water. Where anchor bolts are within 1/4 inch of reinforcing steel, isolate with a minimum of 4 wraps of 10 mil polyvinyl chloride tape in area adjacent to reinforcing steel.

D. In anchoring machinery bases subject to heavy vibration, use 2 nuts, with 1 serving as a locknut.

E. Where bolts are indicated on the Drawings for future use, first coat thoroughly with non-oxidizing wax, then turn nuts down full depth of thread and neatly wrap exposed thread with waterproof polyvinyl tape.

F. Where indicated on the Drawings, set anchor bolts in metal sleeves having inside diameter approximately 2 inches greater than the bolt diameter and a minimum of 10 bolt diameters deep. Fill sleeves with grout when equipment is grouted in place.

3.03 CONCRETE ANCHORS AND ADHESIVE ANCHORS

A. Cast-in-place anchor bolts may be used in place of concrete anchors and adhesive anchors at Contractor's option.

B. Installation

1. Drill holes using concrete drill bits and impact type drill motors. Hole diameter shall be in accordance with the manufacturer's recommendations.

2. Clean drilled hole in accordance with manufacturer's recommendations using a wire brush and compressed air to dislodge and remove drilling dust.

3. Accurately locate concrete anchors and set anchors with axis perpendicular to surfaces from which they will project.

4. Do not disturb adhesive anchors until cure time has elapsed.

5. Unless otherwise indicated on the Drawings or as required by structural calculations prepared by the equipment supplier, comply with minimum embedment lengths identified in the following table.

Minimum Embedment Lengths for Concrete and Adhesive Anchors

Diameter of Anchor or Bar, inches	Embedment Length for Concrete Anchors, inches	Embedment Length for Adhesive Anchors or Reinforcing Bars
1/4	1-3/4	As indicated on the Drawings
3/8	1-7/8	
1/2	2-1/4	
5/8	2-3/4	
3/4	3-1/4	
(1) Provide longer embedment where otherwise indicated		

END OF SECTION

SECTION 09 96 00

HIGH PERFORMANCE COATINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Materials, surface preparation, application, curing, and inspection for industrial, high-performance coatings on interior and exterior surfaces.

B. Furnish all labor, materials, tools and equipment required to perform surface preparation, coating work, and inspection as specified. Perform all subsidiary and incidental work necessary to complete the work in conformance with the project requirements, to accomplish the approved end result of a totally protected and usable structure, including all attachments, accessories and appurtenances.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals
2. Section 01 66 00 – Materials and Equipment
3. Section 01 99 00 – Reference Forms

1.03 DEFINITIONS

A. Abrasive: Material used for blast-cleaning, such as grit.

B. Abrasive Blast Cleaning: Cleaning/surface preparation by abrasive propelled at high speed.

C. Anchor Pattern: Profile or texture of prepared surface(s).

D. Bug Holes: Small cavities, usually not exceeding 15 mm in diameter, resulting from entrapment of air bubbles in the surface of formed concrete during placement and compaction.

E. Coating/Lining Thickness: The total thickness of primer, intermediate and/or finish coats.

F. Dewpoint: Temperature of a given air/water vapor mixture at which condensation starts.

G. Dry Film Thickness (DFT): Depth of cured film, usually expressed in mils (0.001-inch). Use this definition as opposed to existing definition.

H. Drying Time: Time interval between application and curing of material.

I. Dry to Recoat: Time interval between application of material and ability to receive next coat.

J. Dry to Touch: Time interval between application of material and ability to touch lightly without damage.

K. Feather Edging: Reducing the thickness of the edge of paint.

L. Feathering: Operation of tapering off the edge of a point with a comparatively dry brush.

M. Field Coat: The application or the completion of application of the coating system after installation of the surface at the site of the work.

N. Hold Point: A defined point, specified in this Section 09 96 00, at which work shall be halted for inspection.

O. Holiday: A discontinuity, skip, or void in coating or coating system film that exposes the underlying substrate.

P. Honeycomb: Segregated condition of hardened concrete due to non-consolidation.

Q. Incompatibility: Inability of a coating to perform well over another coating because of bleeding, poor bonding, or lifting of old coating; inability of a coating to perform well on a substrate.

R. Laitance: A layer of weak, non-durable concrete containing cement fine that is brought to the surface through bleed water as a result of concrete finishing/overfinishing.

S. Mil: 0.001-inch.

T. Overspray: Dry spray, particularly such paint that failed to strike the intended surface.

U. Pinhole: A small diameter discontinuity in a coating or coating system film that is typically created by outgassing of air from a void in a concrete substrate resulting in exposure of the substrate or a void between coats.

V. Pot Life: Time interval after mixing of components during which the coating can be satisfactorily applied.

W. Resurfacer/Resurfacing Material: A layer of cementitious and/or resin-sed material used to fill or otherwise restore surface continuity to worn or damaged concrete surfaces.

X. Shelf Life: Maximum storage time for which a material may be stored without losing its usefulness.

Y. Shop Coat: One or more coats applied in a shop or plant prior to shipment to the site of the work, where the field or finishing coat is applied.

Z. Spreading Rate: Surface area covered by a unit volume of paint at a specific film thickness.

AA. Stripe Coat: (SSPC Guide 11) A separate coat of paint applied to all weld seems, pits, nuts/bolts/washers, and edges by brush. This coat shall not be applied until any previous coat(s) have cured and, once applied, shall be allowed to cure prior to the application of the subsequent coat(s).

BB. Surface Saturated Dry (SSD): Refers to concrete surface condition where the surface is saturated (damp) without the presence of standing water.

CC. Tie Coat: An intermediate coat used to bond different types of coatings. Coatings used to improve the adhesion of a succeeding coat.

DD. Touch-Up Painting: The application of paint on areas of painted surfaces to repair marks, scratches, and areas where the coating has deteriorated to restore the coating film to an unbroken condition.

EE. Volatile Organic Compound (VOC) Content: The portion of the coating that is a compound of carbon, is photo chemically reactive, and evaporates during drying or curing, expressed in grams per liter (g/l) or pounds per gallon (lb/gal).

FF. Immersion: Refers to a service condition in which the substrate is below the waterline or submerged in water or wastewater at least intermittently if not constantly.

GG. Weld Spatter: (NACE SPO-178) Beads of metal scattered near seam during welding.

HH. Wet Film Thickness (WFT): The primer or coating film's thickness immediately following application. Wet film thickness is measured in mils or thousandths of an inch (0.001-inch) and is abbreviated WFT.

1.04 REFERENCES

A. ANSI – American National Standards Institute

B. ASTM – American Society for Testing and Materials

C. CSA – Canadian Standards Association

D. IAPMO – International Association of Plumbing and Mechanical Officials

E. SSPC – The Society for Protective Coatings

F. NACE International – National Association of Corrosion Engineers International

G. NSF International – National Sanitation Foundation International

H. UL – Underwriters Laboratories

I. WQA – Water Quality Association

1.05 SUBMITTALS

A. Comply with Section 01 33 00.

B. Finish Schedule

1. Submit a complete Finish Schedule that includes the surfaces in the Finish Schedule herein and any additional surfaces to be coated by the products submitted under this Section 09 96 00. Indicate the specific products and manufacturer for each item (equipment, substrate, or structure) to be coated.

2. Submit a color card or fan deck for each manufacturer and coating product submitted. Items in the complete Finish Schedule shall be confirmed with Owner-approved colors for each location prior to ordering materials.

C. Product Technical Data

1. Product Data Sheets: Submit coating manufacturer's technical data on products and recommended use. Include the brand name and series number of all coatings to be used. Submit product data sheets for all coating systems that include the following information:

a. VOC data.

b. Storage requirements.

c. Primer type, where required.

d. Maximum dry and wet mil thickness per coat.

e. Minimum and maximum curing time between coats and final cure times, including atmospheric conditions for each.

f. Curing time before submergence in liquid.

g. Thinners/solvents for reduction and cleaning.

h. Ventilation requirements.

i. Minimum and maximum atmospheric and substrate application conditions.

j. Allowable application methods.

k. Maximum allowable moisture content (concrete substrates).

l. Maximum shelf life.

2. Material Safety Data Sheets (MSDS): Submit coating manufacturer's Material Safety Data Sheets (MSDS) for products to be used on the project, including solvents, additives, cleaners, and thinners.

3. Surface Preparation Criteria: Submit coating manufacturer's surface preparation criteria, including recommended surface profile range after abrasive blasting.

4. Application Instructions: Submit Coating manufacturer's application instructions and equipment recommendation.

D. Certifications

1. VOC Content: Submit coating manufacturer's certification indicating that the submitted coatings meet regulations for allowable VOC content in the place of application and use intended.

2. NSF 61 Certification: Submit NSF 61 certification or listing for products applied to surfaces in contact with process (potable or to be treated to potable) water.

3. Compatibility Confirmation: Submit written confirmation by the shop and field applied coating manufacturers indicating that the compatibility between the shop and field applied coatings have been checked and approved by those manufacturers.

E. Coating Plan/Program

1. Cleaning and Abrasive Blasting Equipment: Submit abrasive blast cleaning and application equipment list and complete procedures for its use.

2. Coating System Treatment and Termination: Submit detailed, written instructions and/or graphic details for coating system treatment and coating system terminations for items to be coated in the project.

3. Overspray and Fugitive Dust Prevention: Submit contractor's written program for over spray prevention.

4. Recoating Information and Schedule: Submit information that defines the end date for field coating application for all equipment, machinery, and piping to ensure that the maximum recoat time for the shop applied primers will not be exceeded when field applied coatings are installed.

F. References and Qualifications

1. Manufacturer Project References: Submit a minimum of five project references, including current contact name, address, and telephone number where proposed coating products have been successfully used in similar coating applications within the past 5 years.

2. Applicator Project References: Submit a minimum of five project references, including current contact name, address, and telephone number where the Coatings Applicator has successfully performed similar coating work within the past 5 years.

3. Applicator Quality Assurance: Submit a letter from the selected and approved coating manufacturers for the project that verifies that the applicator meets the qualifications and quality assurance requirements in this Section (09 96 00).

4. Inspector Qualifications: Submit Qualifications for Quality Control personnel to be provided on site by the Contractor including, but not limited to, the inspector's NACE and SSPC Certification numbers for the certifications as requested in this Section (09 96 00).

1.06 QUALITY ASSURANCE

A. Regulatory Requirements

1. All work, materials, procedures, and practices under this Section (09 96 00) shall conform to the requirements of the applicable Federal, State, County, and local regulations and ordinances. The Contractor shall be responsible for securing any and all licenses, certificates, and permits required for the work at no additional cost to the Owner.

2. Prime and finish coat painting done at the project site or in locations other than the project site shall be in accordance with the air quality regulations in effect at the place the coating is applied.

3. All debris (liquid or solid) generated from surface preparation or coating activities shall be tested and disposed offsite in accordance with applicable Federal, State, County, and local regulations and ordinances. The Contractor shall be responsible for all required testing, monitoring, reporting, licenses, permits, and fees at no additional cost to the Owner.

B. Unit Responsibility

1. Assign unit responsibility for the materials, surface preparation, and coatings application to the Coatings Application Subcontractor .

2. Provide a certificate of Unit Responsibility. See Section 01 99 90.

C. Materials

1. Contaminated, outdated, diluted materials, and/or materials from previously opened containers shall not be used.

2. Each coating system shall have only one product used for the finish coat to ensure consistency in appearance throughout the project.

3. Delivery of coating system materials shall be in original, unopened containers with seals unbroken and labels intact. Labels shall identify type of material, color, and batch number. No material shall exceed six months from the original batch manufacturing date (No exceptions).

4. For repairs, the Contractor shall provide the same products, or products recommended by the coating manufacturer, as used for the original coating.

D. Qualifications

1. Coatings Manufacturer Requirements

a. Minimum of ten (10) years of successful experience manufacturing protective coatings. Submit list of references to demonstrate successful performance on comparable projects.

2. Coatings Applicator Requirements

a. Minimum of five (5) years practical experience and successful history in the application of similar products on comparable projects. Submit list of references.

E. Pre-Painting Conference

1. Schedule pre-painting conference with the Owner.

2. Do not proceed without holding a pre-painting conference with the Owner, Contractor, Inspector, Coating Applicator and Manufacturer.

3. Topics for discussion include:

a. Site conditions

b. Coating materials and manufacturer's application recommendations.

c. Surface preparation prior to abrasive blast cleaning.

d. Specification compliance of blast abrasives and surface profile requirements.

e. Schedule of field surface preparation and coating application, and order of the work.

f. List of equipment and procedures for cleaning, blasting, coating application, ventilation and dehumidification (if required).

g. Safety programs and the enforcement to be used during the course of the work.

h. Weather limitations for acceptable work.

i. Inspection facilities and equipment to be provided.

j. Hold points and inspector’s authority.

k. Establish non-conformance procedures, and chain of command and who signs off on completion of bringing the job back into compliance.

l. Procedures for over-spray prevention.

F. Coatings Applicator Personnel

1. Provide a supervisor at the work site during cleaning, surface preparation, and coating operations.

2. Provide skilled personnel qualified to perform work to industry standards of practice and safety, maintain continuity of personnel, and coordinate any transfer of personnel with the Owner.

G. Quality Control Requirements

1. The Contractor is responsible for ensuring that the surface preparation and coating activities meet the requirements of this specification. Observations by the Engineer, or a representative of the coating manufacturer, will not relieve or limit the Contractor's responsibilities.

2. Coatings application shall conform to requirements of this specification and the referenced standards. Changes in the coating system installation requirements will be allowed only with the written authorization of the Engineer before work commences.

3. The Contractor shall conduct the work and maintain appropriate and measurable quality control activities to ensure that the coating systems are installed as specified. Coating system work that does not conform to the Specifications or is otherwise not acceptable shall be corrected in accordance with the coating manufacturer's written procedures.

    a. Measure all dry film thicknesses. Readings shall be conducted as defined in SSPC-PA2.

    b. The Owner may, but is not required to, also measure coating thickness, at random locations, after each coat. SSPC –PA 2 (Level 1) is only to be used for the calibration of dry film thickness gauges. This is a minimum maximum dry film thickness specification. Dry film thickness readings will not be averaged. All inspection equipment shall be supplied by the Contractor. All equipment shall have current calibration certificates. The Owner reserves the right to use their own equipment at any time.

4. The Contractor shall prepare and submit coating work daily reports for each day while on site. The coating work daily reports shall be submitted to the Engineer no later than 1:00 p.m. the following workday. The coating work daily reports shall include the following:

    a. Number of coating applicator employees on site.

    b. Start and finish time of work shift.

    c. Climatic conditions at 4-hour intervals (i.e., partly cloudy, air temperature 78°F, relative humidity 63%, dew point 68°F, and WNW wind @ 4 mph).

    d. Major equipment on site regardless of utilization (i.e., trailers, air compressors, generators, spray pumps, scaffolding, aerial lifts, pressure washers, and sandblast pots).

    e. Inventory of coatings, solvents and abrasive media stored on site including information relative to deliveries received each day.

f. Summary of work performed to include:

1) Substrates/structures prepared (size, quantity, and location).
2) Surface preparation methods including materials consumed and equipment utilized.
3) Substrates/structures coated (size, quantity, and location).
4) Mixing method and time mixed (coating materials).
5) Induction time, pot life, and application start time.
6) Coating application methods including equipment utilized.
7) Application finish time.
8) Coating materials consumed [sequencing, product name, batch number(s) and manufacture date].
9) Problems encountered (i.e., equipment malfunctions or disruption/interference by other trades).
10) Accidents or near misses.
11) Quality control testing results.

H. On-site Inspection

1. The Contractor shall identify the points of access for inspection. The Contractor shall provide ventilation, ingress and egress, and other means necessary for the Owners' personnel to safely access the work areas.
2. The specified quality control tasks shall be performed by a NACE-certified inspector hired and paid for by the Owner.
3. Acceptance criteria for each Quality Control test shall be as indicated on the manufacturer's published data or in this specification, whichever is more stringent.

1.07 WARNINGS

A. Application of paint, epoxy, and protective coating materials may be hazardous. Take all necessary precautions to ensure the safety of workers and property.

B. Part of this work requires abrasive blasting. This may require the use of special equipment. Become familiar with the existing site conditions and take all steps necessary to protect adjacent facilities and personnel, at no additional cost to the Owner. Abrasive blasting and painting is called for in, on, or around mechanical equipment, which may be damaged by grit, dust, or painting overspray. Mask, wrap, enclose, and provide all protection required to safeguard this equipment at no additional cost to the Owner.

C. Perform abrasive blasting activities in a manner that will not cause nuisance.

1.08 EXTRA MATERIALS

A. Supply 1 gallon of each color, type, and surface texture. Store where directed.

B. Label each container with color, type, texture, and room locations, in addition to manufacturer's label.

1.09 WARRANTY

A. Provide material and workmanship warranty for coatings of 18 months from date of final acceptance by the Owner

B. Complete the Extended Warranty Form in Section 01 99 00

C. See also Paragraph 3.10.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products identified for each coating system are the product names from specific manufacturers. Coatings products from other manufacturers and of equal or higher quality and performance may also be acceptable.

1. Requests for Substitution of Alternative Coatings Products:

a. Include the full name of each product, descriptive literature, test data, data on past performance, manufacturer's instruction for use, generic type, and its nonvolatile content by volume.

b. Demonstrate product and performance is equivalent to the specified materials and complete systems.

c. Demonstrate that the coatings manufacturer has local qualified representation which will provide onsite technical support to resolve field problems with the manufacturer's products, materials or application for the duration of the project.

B. Requests for substitution of alternative coating products that decreases the specified dry-film thickness or the number of coats to be applied, or which changes the generic type of coating specified, will not be considered.

2.02 ABRASIVES FOR BLAST CLEANING

A. Use only new materials that are clean and free of contaminants.

B. Materials must be certified by the California Air Resources Board (CARB) for use in dry, open air abrasive blasting.

C. The Contractor shall use abrasive grit for field blast cleaning conforming to the following:

1. Produce a sharp angular surface profile of 1.5 to 2.5 mils

2. New, clean and free of contaminants (SSPC AB 1), and containing no hazardous materials.

D. Comply with all applicable requirements of Cal/OSHA and the Bay Area Air Quality Management District. Abrasives shall be certified by California Air Resources Board, Executive Order G-565.

E. Purchase only from firms which can accept spent abrasives, then process spent abrasives for recycle or proper disposal.

2.03 COATING SYSTEMS

A. System No. 1 – Zinc-Epoxy-Polyurethane System

1. Surface: Metal.

2. Service: Interior; exterior; exposed to direct sunlight; not immersed.

3. Surface Preparation

a. Shop-Primed Metal

1) Clean shop-primed surfaces in accordance with SSPC SP-2 (Hand Tool Cleaning).

2) Clean damaged shop-coated areas in accordance with SSPC SP-3 (Power Tool Cleaning) and recoat with specified primer.

3) For factory-coated or shop-primed pumps, tanks, and other equipment, delete zinc-rich primer and use compatible primer as recommended by the coating manufacturer. All repair areas shall be abraded and de-glossed and feathered into a smooth transition.

b. Bare Metal

1) Prepare surface in accordance with SSPC SP-6 (Commercial Blast Cleaning) to 1.5 to 2.5 mil (Thin film systems)surface profile.

2) For ductile iron pipe, prepare surfaces in accordance with NAPF 500-03, NAPF 500-03-04, and NAPF 50.

3) Clean ferrous metal with bleeding in accordance with SSPC SP-11 (Power Tool Cleaning to Bare Metal).

4) Spot blast areas of rust penetration to SSPC SP-10 (Near White Blast) and spot prime with specified primer.

c. Galvanized Metal

1) Clean damaged galvanized steel areas with exposed ferrous metal and/or rust in accordance with SSPC SP-5 (White Metal Blast Cleaning) or SSPC SP-11 (Power Tool Cleaned to Bare Metal) to achieve uniform 1.0 to 1.5 mil profile; spot prime with specified primer.

2) Prepare galvanized, non-ferrous metal in accordance with SSPC SP-16 to impart uniform 1.0 to 1.5 mil profile.

3) For galvanized steel, delete zinc primer.

4. Primer

a. Field apply one coat of zinc-rich epoxy primer, or polyurethane primer where zinc-rich primer is to be omitted, compatible with urethane finish; comply with written instructions of coating manufacturer.

b. Thickness: 3.0 to 4.0 dry mils.

c. Products: Sherwin Williams, Zinc Clad 4100; Carboline, 859; or equal.

5. Intermediate

   a. Field apply one coat of intermediate or primer epoxy.

   b. Thickness: 5.0 to 6.0 dry mils.

   c. Product: Sherwin Williams, Macropoxy 646 FC; Carboline, Carboguard 890; or equal.

6. Finish

   a. Field apply one coat of polyurethane finish.

   b. Thickness: 2.0 to 3.0 dry mils.

   c. Product: Sherwin Williams, Hi Solids Polyurethane 250; Carbothane 134VOC; or equal.

B. System No. 2 – NSF Epoxy

1. Surface: Metal.

2. Service: Interior of tanks and other metal components in contact with water.

3. Surface Preparation

   a. Shop-Primed Metal

      1) Clean shop-primed surfaces in accordance with SSPC SP-2 (Hand Tool Cleaning) or SSPC SP-3 (Power Tool Cleaning).

      2) Clean damaged shop-coated areas in accordance with SSPC SP-5 (White Metal Blast Cleaning) and spot prime with specified primer. Cleaning shall produce a surface profile of 2.0 to 2.5 mils.

      3) Shop epoxy primed surfaced shall require abrasive blasting or abrading per SSPC-SP 7 prior to receiving finish coats if the maximum recoat limit has been exceeded for the primer. This cleaning shall produce a uniform surface profile of 1.0 to 1.5 mils in the intact primer.

   b. Bare Ferrous Metal

      1) Prepare surface in accordance with SSPC SP-5 (White Metal Blast Cleaning) to 2.0 to 2.5 mil surface profile.

   c. Nonferrous and Galvanized Metal

      1) Prepare in accordance with SSPC SP-16 to achieve a uniform 1.0 to 1.5 mil profile.

4. System Thickness: Minimum 10 mils dry film.

5. Primer

   a. Field apply one coat of the epoxy primer at the manufacturer's recommended dry film thickness.

   b. Products: Sherwin Williams, Macropoxy 646; Carboline, Carboguard 691; or equal.

6. Finish

a. Field apply one or more coats of the epoxy finish at the manufacturer's recommended dry film thickness per coat to the specified system thickness.

b. Product: Sherwin Williams, Macropoxy 646; Carboline, Carboguard 691; or equal.

C. System No. 3 – Polyamidoamine Epoxy

1. Surface: Metal.

2. Service: Below grade (buried, exterior) in contact with soil.

3. Surface Preparation

a. Shop-Primed Metal

1) Clean shop-primed surfaces in accordance with SSPC SP-2 (Hand Tool Cleaning) or SSPC SP-3 (Power Tool Cleaning).

2) Clean damaged shop-coated areas in accordance with SSPC SP-10 (Near White Metal Blast Cleaning) and spot prime with specified primer. Cleaning shall produce a surface profile of 2.0 to 2.5 mils.

3) Shop epoxy primed surfaced shall require abrasive blasting or abrading per SSPC-SP 7 prior to receiving finish coats if the maximum recoat limit has been exceeded for the primer. This cleaning shall produce a uniform surface profile of 1.0 to 1.5 mils in the intact primer.

b. Bare Ferrous Metal

1) Prepare surface in accordance with SSPC SP-10 (Near White Metal Blast Cleaning) to 2.0 to 2.5 mil surface profile.

4. System Thickness: Minimum 16 mils dry film.

5. Finish

a. Field apply two or more coats at the coating manufacturer's recommended dry film thickness per coat to the specified system thickness.

b. Product: Sherwin Williams, Macropoxy 646; Carboguard 890; or equal.

D. System No. 4 – Acrylic (Latex)

1. Surface: PVC and CPVC pipe.

2. Service: Exterior; direct sunlight exposure.

3. Surface Preparation

a. Clean plastic pipe with a solvent compatible with the specified primer.

b. Sand plastic pipe to uniformly abrade and de-gloss surfaces to achieve a surface profile of 1.0 to 1.5 mils. Vacuum clean after sanding to remove loose dust, plastic particles, and dirt.

4. System Thickness: Minimum 3 mils dry film.

5. Primer

    a. Field apply one coat of acrylic primer.

    b. Thickness: To the coating manufacturer's recommended dry film thickness.

    c. Product: Sherwin Williams, Extreme Bond; Carboline, Sanitile 120; or equal.

6. Finish

    a. Field apply one or more coats at the coating manufacturers recommended dry film thickness per coat to provide the specified system thickness.

    b. Thickness: To system thickness.

    c. Product: Sherwin Williams, Sher-Cryl HPA; Carboline, Carbocrylic 3359 DTM.

E. System No. 5 – Polyurethane

1. Surface: Concrete

2. Service: Interior, immersed

3. Surface Preparation:

    a. Complete and cure concrete construction for 30 days or more before starting surface preparation work.

    b. Prepare surfaces in accordance with SSPC-SP 13/NACE 6 or ICRI 03732 to obtain CSP 4 to 6 roughness

    c. Eliminate leaks and infiltrations and remove standing water

    d. Resurface areas with excessive cavities or exposed aggregate

    e. Surface must be free of dust, condensation and visible moisture before application

4. System Thickness: 60 mils dry film

5. Primer

    a. Field apply one coat of epoxy primer.

    b. Thickness: To the coating manufacturer's recommended dry film thickness.

    c. Product: Sherwin Williams, Macropoxy 5500LT or Corobond 100 Primer; Carboline Carboseal 720

6. Finish

    a. Field apply one or more coats at the coating manufacturers recommended dry film thickness per coat to provide the specified system thickness.

    b. Thickness: To system thickness.

    c. Product: Sherwin Williams Poly-Cote 115; Carboline Reactamine 760

2.04 FINISH SCHEDULE

A. The following Finish Schedule identifies major structures, equipment, and substrates to be coated in accordance with this Section (09 96 00). The Finish Schedule is not intended to be a complete listing of all surfaces to be coated and other requirements may be identified elsewhere in the Specifications or on the Drawings. There may be additional surfaces for the project that require coating application which may not be listed in the Finish Schedule, and the Contractor shall be responsible for coating those surfaces in accordance with the requirements of this Section(09 96 00).

Structure	Substrate	Coating System	Color
Exposed Ferrous Metal Piping, Equipment, and Structures	Ferrous Metal	No. 1	Determined by Owner
Potable Water Piping, Exposed	Ferrous Metal	No. 2	Determined by Owner
Submerged DIP	Ferrous Metal	No. 3	Determined by Manufacturer
Exposed PVC Piping	Thermoplastic	No. 4	Determined by Owner

B. The Contractor shall be responsible to identify any surfaces for which there is a question about what standard coating system to apply. about what standard coating system to apply as part of the work covered by this Section (09 96 00) through a Request for Information.

PART 3 - EXECUTION

3.01 PRODUCT SHIPMENT, PROTECTION, AND STORAGE

A. Comply with Section 01 66 00.

B. Delivery

1. Deliver in original sealed containers identified with labels indicating manufacturer; product name and number; color, batch or lot number, and date of manufacture.

2. Note the date of manufacture and apply coatings prior to the expiration of the guaranteed storage life.

3. Coating materials exceeding storage life will be rejected.

C. Storage

1. Store coating materials in enclosed structures to protect from weather and excessive heat or cold.

2. Coatings stored at above or below manufacturers recommendations will be rejected.

3. Comply with state and local requirements for flammable materials.

3.02 SCAFFOLDING

A. Furnish, maintain, and remove scaffolding, ladders, planks required for application of coatings. Scaffolding, ladders, and rigging shall be designed for their intended use and shall comply with OSHA requirements.

B. Where requested by the Owner, provide ladders or scaffolding to facilitate inspection of the specified work.

3.03 HEALTH AND SAFETY REQUIREMENTS

A. General

1. Comply with the applicable health and safety requirements of OSHA and the recommendations of the product manufacturer.

2. Provide and require the use of proper personal protective and life saving equipment for all persons visiting or working in or about the project site.

B. Ventilation: Ventilate work areas to control potential exposure and hazard to workers and employees of the plant.

1. Furnish and install temporary ventilation system to remove contaminated air, vapors, and other potential hazardous substances from confined spaces and interiors of containment structures. Forced air ventilation is required during blast cleaning, abrasive removal, coating application, and curing in confined spaces.

2. Ventilation system equipment shall be explosion proof, of industrial design, and of adequate capacity to reduce the concentration of air contaminants to the degree that a hazard to workers or employees of the plant does not exist. Size ventilation system to maintain air changes within the confined space per OSHA regulations.

C. Illumination

1. Provide spark proof artificial lighting for all work in confined spaces.

2. Equip light bulbs with a protective cage to prevent breakage.

3. For lighting fixtures and bulbs, comply with the requirements of Section 70 of the National Fire Protection Association (NFPA), "National Electric Code", for the applicable atmosphere.

4. For lighting and other electrical systems, provide ground fault type, complying with NFPA 70.

5. Provide the following minimum illumination during all phases of work:

a. General work area: 25-Foot Candles.

b. Surface preparation and coating application: 30-Foot Candles.

c. Inspection: 50-Foot Candles per SSPC-Guide 12.

6. As directed by the Owner, provide additional illumination to fully illuminate all areas to be inspected.

D. Noise

1. Whenever the occupational noise exposure exceeds the maximum allowable sound level as set forth by OSHA regulations, the regional Air Pollution Control District and/or the Owner, provide and require the use of approved ear protection devices.

2. General maximum sound levels for the project are defined as those which will not affect routine facility or neighborhood activities.

3. Whenever levels are objectionable, or exceed these limits, adjust operations to reduce noise levels, as directed by the Owner or the local agency of jurisdiction.

E. Fire Extinguishers

1. Keep a minimum of two (2) ten pound (10-lb) ABC type fire extinguishers present in the work area whenever work is proceeding.

2. Train all personnel in the use of this type of fire extinguisher.

F. Comply with OSHA and applicable regulations and carefully follow the manufacturer's recommendations, precautions, and warnings regarding the handling and use of all surface preparation and coating materials and equipment.

G. Use coating equipment designed for application of the material specified and maintain in good working condition at all times.

3.04 ENVIRONMENTAL CONTROL

A. Carefully contain paints and solvents. Do not allow them to penetrate the soil.

B. Dispose of waste material in a legal manner. All stationary operating equipment shall be placed into secondary containment.

3.05 PREPARATION

A. General

1. Surface preparations for each type of surface shall be in accordance with the specific requirements of each Coating Systems Description. In the event of a conflict the Coating Systems Description shall take precedence.

2. Surfaces to be coated shall be clean and dry. Before applying coating or surface treatments, oil, grease, dirt, rust, loose mill scale, old weathered coatings, and other foreign substances shall be removed. Oil and grease shall be removed before mechanical cleaning is started. Where mechanical cleaning is accomplished by blast cleaning, the abrasive used shall be washed, graded and free of contaminants which might interfere with the adhesion of the coatings. The air used for blast cleaning shall be sufficiently free of oil and moisture to not cause detrimental contamination of the surfaces to be coated.

3. The Contractor shall verify at a minimum of two times daily that air supply is free of oil and moisture contamination (ASTM D-4285). The Contractor shall use effective oil and water separators in all main compressor airlines and shall be placed as close as practicable to the equipment. Prior to using compressed air, the Contractor shall test the quality of air downstream of the separators at

suitable outlets by blowing the air on clean white blotter for 2 minutes to check for any contamination, oil, or moisture.

4. Cleaning and coating shall be scheduled so that dust and spray from the cleaning process shall not fall on wet, newly coated surfaces. Hardware, hardware accessories, nameplates, data tags, machined surfaces, sprinkler heads, electrical fixtures, and similar uncoated items which are in contact with coated surfaces shall be removed or masked prior to surface preparation and painting operations. The Coating Inspector will examine surfaces after abrasive blast cleaning to verify that all deposits of contaminants have been removed as per surface clean as per ISO 8502 (Class 2). The Contractor shall blow down and vacuum all surfaces prior to Owner inspection. Tank floors shall be vacuumed. Following completion of coating, removed items shall be reinstalled. Equipment adjacent to walls shall be disconnected and moved to permit cleaning and painting of equipment and walls and, following painting, shall be replaced and reconnected.

5. Containment: The Contractor shall erect and maintain protective enclosures as required to ensure that surface preparation debris, including dust, is contained within the immediate work area. All costs associated with containment shall be paid by the Contractor.

6. Dust and Contaminants: Protect substrate from excessive dust and airborne contaminants during coating application and curing. Use temporary dust barriers to close off areas being painted from areas where other work is being performed.

B. Abrasive Blast Cleaning

1. When abrasive blast cleaning is required to achieve the specified surface preparation the following requirements for blast cleaning materials and equipment shall be met:

   a. Used or spent blast abrasive shall not be reused on this project.

   b. The compressed air used for blast cleaning shall be filtered and shall contain no condensed water and no oil. Moisture traps shall be cleaned at least once every four hours or more frequently as required to prevent moisture from entering the supply air to the abrasive blasting equipment.

   c. Oil separators shall be installed just downstream of compressor discharge valves and at the discharge of the blast pot discharges. These shall be checked on the same frequency as the moisture traps as defined in Item 2 above.

   d. Regulators, gauges, filters, and separators shall be in use on compressor air lines to blasting nozzles times during this work.

   e. An air dryer or desiccant filter drying unit shall be installed which dries the compressed air prior to blast pot connections.

   f. The air dryer shall be used and maintained for the duration of surface preparation work.

   g. The contractor shall provide ventilation for airborne particulate evacuation (meeting pertinent safety standards) to optimize visibility for both blast cleaning and inspection of the substrate during surface preparation work.

h. If, between final surface preparation work and coating system application, contamination of prepared and cleaned metallic substrates occurs, or if the prepared substrates' appearance darkens or changes color, re-cleaning by water blasting, re-blasting and abrasive blast cleaning shall be required until the specified degree of cleanliness is reclaimed.

i. The contractor is responsible for dust control and for protection of mechanical, electrical, and other equipment adjacent to coatings work.

C. Solvent Cleaning

1. Any solvent wash, solvent wipe, or cleaner used, including but not limited to those used for surface preparation in accordance with SSPC SP-1 Solvent Cleaning shall be of the emulsifying type which emits no more than 340 g/l VOCs for AIM regions, 250 g/l for CARB regions and 100 g/l for SCAQMD regions, contains no phosphates, is biodegradable, removes no zinc, and is compatible with the specified primer.

2. Clean white cloths and clean fluids shall be used in solvent cleaning.

D. Ferrous Metal Substrates

1. Ferrous surfaces shall be prepared in accordance with applicable surface preparation specifications of SSPC/NACE specified for each coating system. Specific surface preparation requirements are stated in the Coating Systems Description. The profile depth of the surface to be coated shall be in accordance with the Coating Systems Description requirements and shall be measured by Method C of ASTM D4417. Blast particle size shall be selected by the Contractor to produce the specified surface profile. The solvent in solvent cleaning operations shall be as recommended by the coating manufacturer.

2. Preparation of ferrous metal surfaces shall be based upon comparison with SSPC-VIS1, and as described in the Coating Systems Description for each coating system. If dry abrasive blast cleaning is selected and to facilitate inspection, the Contractor shall, on the first day of cleaning operations, abrasive blast metal panels to the standards specified. Plates shall measure a minimum of 8-1/2 inches by 11 inches. Panels meeting the requirements of the specifications shall be initialed by the contractor and the Owner and coated with a clear nonyellowing finish. One of these panels shall be prepared for each type of abrasive blasting and shall be used as the comparison standard throughout the project.

3. Blast cleaning requirements for steel, and ductile-iron, are as follows:

a. Ferrous steel piping shall be prepared in accordance with SSPC SP-6 and primed before installation.

b. Ductile-iron piping surfaces including fittings shall be prepared in accordance with NAPF 500-03, NAPF 500-03-04, and NAPF 50.

c. Remove traces of grit, dust, dirt, rust scale, friable material, loose corrosion products or embedded abrasive from substrate by vacuum cleaning prior to coating application per ISO 8502 (Class 2).

d. Care must be taken to prevent contamination of the surface after blasting from worker's fingerprints, deleterious substances on workers' clothing, or from atmospheric conditions.

E. Thermoplastic

1. Prepare surfaces of PVC by sanding to establish uniform surface roughness and to remove gloss from the substrate. Vacuum clean surfaces to remove loose dust, dirt, and other materials. Next, solvent clean using clean white rags and allow solvent to completely evaporate before application of coating materials.

3.06 APPLICATION

A. Workmanship

1. Coated surfaces shall be free from excessive runs, sags, drips, ridges, waves, laps, and brush marks. Coats shall be applied to produce an even film of uniform thickness completely coating corners and crevices. Minor and infrequent runs and sags which are within the total specified DFT plus a few mils – no more than 10% more mils than the specified total DFT shall be acceptable. Frequent runs or sags which exceed these limits or are detrimental to coating system performance are not acceptable.

2. The Contractor's spray equipment shall be designed for application of the materials specified. Compressors shall have suitable traps and filters to remove water and oils from the air. Spray equipment shall be equipped with mechanical agitators, pressure gages, and pressure regulators, and properly sized spray tips.

3. Each coating application be applied evenly and sharply cut to line. Care shall be exercised to avoid overspray or spattering paint on surfaces not to be coated. Glass, hardware, floors, roofs, and other adjacent areas and installations shall be protected by taping, drop cloths, or other suitable measures.

4. Coating applications method shall be as recommended by the coating manufacturer.

5. Allow each coat to cure or dry thoroughly, according to the coating manufacturer's printed instructions, prior to recoating.

6. Vary color for each successive coat for coating systems when possible. When coating complex steel shapes, prior to overall coating system application, stripe coat welds, edges of structural steel shapes, metal cutouts, pits in steel surfaces, or rough surfaces with the prime coat. This involves applying a separate coat using brushes or rollers to ensure proper coverage. Stripe coat via spray application is not permitted.

B. Coating Properties – Mixing and Thinning

1. Coatings, when applied, shall provide a satisfactory film and smooth even surface. Glossy undercoats shall be lightly sanded to provide a surface suitable for the proper application and adhesion of subsequent coats. Coating materials shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Coatings consisting of two or more components shall be mixed in accordance with the coating manufacturer's instructions. Where necessary to suit the conditions

of the surface, temperature, weather and method of application, the coating may be thinned as recommended by the coating manufacturer immediately prior to use. The VOC of the coating as applied shall comply with prevailing air pollution control regulations. Unless otherwise specified, coatings shall not be reduced more than necessary to obtain the proper application characteristics. Thinner shall be as recommended by the coating manufacturer.

2. Mixing of partial "kits" is strictly prohibited unless authorized in writing by the coating manufacturer and the Owner. This prohibition also applies to coatings mixed for touchup or repairs. If authorized to mix partial kits, the contractor shall utilize containers with appropriate graduated markings/calibrated weight scales.

C. Environmental Conditions

1. Provide adequate heat, ventilation, and dehumidification to ensure that the coating manufacturer's environmental requirements are met and to ensure no loss of production days due to failure to meet coating manufacturer's environmental requirements.

2. Provide sufficient and continuous ventilation and air movement across coated substrates to remove volatile constituents (solvent) throughout the manufacturer's published curing period.

3. Air and surface temperatures: Prepare surfaces, apply and cure coatings within air and surface temperature range recommended by coating manufacturer.

4. Relative humidity: Prepare surfaces, apply and cure coatings within relative humidity range in accordance with coating manufacturer's instructions.

5. Dew Point: Do not apply coatings unless the temperature of the dew point is 5°F or greater than the temperature of the substrate.

6. Precipitation: Do not apply coatings in rain, snow, fog, or mist.

7. Wind: Do not spray apply coatings when the wind direction and velocity are such that overspray may result in property damage.

D. Protection of Coated Surfaces

1. Items which have been coated shall not be handled, worked on, or otherwise disturbed, until the coating is completely dry and hard. After delivery at the site, and upon permanent erection or installation, shop-coated metalwork shall be recoated or retouched with specified coating when it is necessary to maintain the integrity of the film.

E. Film Thickness and Continuity

1. WFT of the first coat of the coating system and subsequent coats shall be verified by the contractor, during application of each coat.

2. Coatings shall be applied to the minimum dry film thickness specified as indicated on the CDS. Dry film thickness shall be determined using the appropriate industry standard for the substrate (SSPC-PA 2, SSPC-PA 9, or ASTM D1400). Coatings determined to be above the maximum dry film thickness, as indicated herein or on the coating manufacturer's product data sheet, will be removed at the Owner's discretion.

3. The Inspector may, but is not required to, also measure coating thickness, at random locations, after each coat. SSPC –PA 2 (Level 1) is only to be used for the calibration of dry film thickness gauges. This is a minimum maximum dry film thickness specification. Dry film thickness readings will not be averaged. All inspection equipment shall be supplied by the Contractor. All equipment shall have current calibration certificates. The Owner reserves the right to use their own equipment at any time.

4. In testing for continuity of coating about welds, projections (such as bolts and nuts), and crevices, the Owner shall determine the minimum conductivity for smooth areas of like coating where the dry mil thickness has been accepted. This conductivity shall be the minimum required for these rough or irregular areas. Pinholes and holidays shall be recoated to the required coverage.

5. The ability to obtain specified film thickness is generally compromised when brush or roller application methods are used and, therefore, more coats may be needed to be applied to achieve the specified dry film thickness.

6. For concrete substrates, the Contractor shall apply a complete skim coat of the specified filler-surfacer material over the entire substrate prior to application of the coating system. This material shall be applied such that all open air voids and "bug holes" in the concrete substrate are completely filled prior to coating application.

F. Special Requirements

1. Before erection, the Contractor shall apply all but the final finish coat to interior surfaces of roof plates, roof rafters and supports, pipe hangers, piping in contact with hangers, and contact surfaces which are inaccessible after assembly. The final coat shall be applied after erection. Structural friction connections and high tensile bolts and nuts shall be coated after erection. Areas damaged during erection shall be hand-cleaned or power-tool cleaned and recoated with primer coat prior to the application of subsequent coats. Touch-up of surfaces shall be performed after installation. Surfaces to be coated shall be clean and dry at the time of application. Except for those to be filled with grout, the underside of equipment bases and supports that have not been galvanized shall be coated with at least two coats of intermediate coat specified for System 1 prior to setting the equipment in place. Provide coating system terminations at leading edges and transitions to other substrates in accordance with the coating manufacturer's recommendations or detail drawings.

G. Soluble Salt Contamination of Metal Substrates

1. Contractor shall test in accordance with SSPC Guide 15 metal substrates to be coated that have been exposed to sea water or coastal air or to industrial fallout of particulate or other sources of soluble chlorides (such as waste water exposure). If testing indicates chloride levels in excess of 25 ppm exist after the surface preparation has been completed. The Contractor shall reclean and prepare these surfaces until chloride levels are below 25 ppm.

3.07 EXCLUSIONS

A. Do not prepare or coat the following items or surfaces:

1. Mortar coated pipe and fittings
2. Sacrificial anodes and support wires
3. Copper, brass
4. Name Plates
5. Fiberglass items

B. Where surfaces specified as "not to be coated" are damaged, coated or otherwise do not comply with these Specifications, clean, repair or otherwise restore such surfaces to the satisfaction of the Owner, at no additional cost to the Owner.

3.08 INSPECTION AND TESTING

A. Perform inspection and testing as specified. Include additional inspection, sampling and testing work that the Owner may require to verify compliance with these Specifications.

B. Notify the Owner three (3) working days in advance of any field operations involving abrasive blast cleaning or coating applications.

C. Assistance to Owner

1. Coordinate work with the inspection, sampling and testing requirements of the Owner
2. Assist the Owner as required for the performance of duties.
3. Provide all lighting and scaffolding to enable the Owner to perform inspection and testing.
4. Provide the level of illumination and scaffolding locations for inspection purposes as directed by the Owner.
5. Furnish Owner with safety equipment and devices during abrasive blast cleaning, coating and painting operations. Provide a helmet with continuous fresh air supply for observation during cleaning operations and coating application.

D. The Owner will perform such tests as are required to help ensure compliance with all phases of the surface preparation, and application of the coating systems. Provide test equipment including, but not be limited to the following: SSPC surface preparation standards; surface profile test tape; micrometer; abrasive sieve test; ultraviolet lamp; sling psychrometer; mirror; certified thickness calibration plates; magnetic type dry film thickness gage; and a nondestructive holiday detector.

E. Inspection by the Owner does not relieve the Contractor of the responsibility of compliance with all the requirements of these specifications.

1. In cases of dispute concerning surface profiles, film thickness, film continuity (holidays), etc., the Owner’s measurements and tests shall be final. Abide by the Owner’s decisions and directives.

2. Correct deficiencies in the continuity of the coating, or painting film or in the dry film thickness by applying additional coats as required, at the sole expense of the Contractor.

F. The Owner will determine the degree and surface profile of the field blast cleaned surface per test method NACE RP0287. Perform additional blast cleaning over areas not conforming to the specified degree of surface preparation and surface profile.

G. Perform tests on surfaces of abrasively blast-cleaned steel to detect oil and other contaminants which might be deposited on surfaces as a result of abrasive blasting operations. This may include chemical tests or ultraviolet (black light) tests, as required.

H. Perform all mixing, thinning, application and holiday detection of coatings in the presence of the Owner.

I. The Owner may completely inspect each application of coating to determine thickness and integrity.

1. Each coating application will be checked and deficiencies marked.

2. After observing specified recoat time apply additional coating materials over areas not having the specified minimum dry film thickness and areas having any holidays or pinholes.

3. After correction of deficiencies, the Owner will re inspect those areas to determine the acceptability of the additional coating.

4. Each coating application must be one hundred (100) percent to the satisfaction of the Owner prior to proceeding with successive coating applications.

J. Dry Film Thickness Measurement

1. Use an approved magnetic type non destructive dry film thickness gauge.

2. Determine that the specified dry film thickness has been obtained.

3. Measure specified dry film thickness' above the peaks of the surface profile.

4. Perform as many dry film thickness measurements, as described in SSPC–PA2, as required to verify compliance with this specification. Use a Type II Constant Pressure Probe Dry Film Thickness Gauge.

K. Furnish calibrated inspection devices in good working condition for detection of holidays and measurement of dry film thickness.

1. Calibrate and operated per manufacturer's instructions.

2. Furnish U.S. Department of Commerce; National Bureau of Standards certified thickness calibrated plates to test the accuracy of dry film thickness gauges and certified instrumentation to test the accuracy of holiday detectors.

3. Keep dry film thickness gauges and holiday detectors available onsite at all times until final acceptance of the application.

L. Owner may elect to furnish inspection devices and render decisions based solely upon test results from these devices.

M. For coating film continuity detection tests on interior structure coated surfaces with 20 mils or less dry film thickness, use a nondestructive holiday detector.

1. Provide personnel to operate coating film continuity detection devices under the direction of the Owner.

2. Operate inspection devices per the manufacture's recommendations in accordance with NACE SPO188.

3. Holiday test any tank lining or coatings that are to be used in immersion. The Contractor shall test all coated surfaces for pinholes (NACE SPO-188) and holidays after application of the final coat in accordance with the following:

   a. Perform test in presence of the Owner Coating Inspector.

   b. Perform test after coating has cured as recommended by the manufacturer.

   c. Use an appropriate detector, such as Elcometer #236 or as approved by the Owner representative.

N. Test the coating integrity of the interior surfaces below the overflow line.

1. Mark all pinholes and repair manufacturer's written recommendations, or as directed by the Owner; and then retest.

2. Holidays or other irregularities are not permitted in the completed coating system.

3. During the testing, keep the detecting blade in continuous contact with the coated surface.

4. Do not proceed with holiday detection until the completed coating system has been cured per the manufacturer's recommendations.

O. Upon completion of the epoxy application to the interior structure surfaces, retest for holidays those areas of the lower shell which may have been subjected to abrasive blast rebound from the floor, repaired as noted herein. Repair areas as required and retest.

P. Measure anchor profile for prepared surfaces using a non destructive instrument such as a Testex Press O Film System.

Q. The Owner will verify completion of the final cure of the interior lining using a solvent wipe test.

1. Solvent wipe test: Consists of rubbing a solvent saturated rag on the area to be tested per ASTM D5402, using solvent recommended by manufacturer.

2. If any coating material is removed or the surface being tested becomes tacky, the coating is not fully cured. Extend curing time and if required continue dehumidification until the coating is fully cured.

R. The Owner may suspend the work if the cleaning and coating operations of the Contractor are creating a localized condition detrimental to facility operation, personnel or adjacent property. In the event of an intermittent or emergency suspension of the work by the Owner, correct deficiencies immediately.

S. Prepare, sign, and submit to the Owner daily inspection reports.

T. Nonconformance Reports

1. When a nonconformance report is required, prepare, sign, and submit to the Owner within one working day from the time that it is written.

2. After confirming that all non-conforming work has been corrected and/or the coating work is in compliance with this specification, prepare and submit a conformance verification report shall be completed for the specific item or area.

3. This report must be signed by the Inspector.

3.09 FINAL CLEANUP

A. Leave all areas in a neat and presentable condition.

B. Remove rubbish, construction debris and waste, surplus construction materials, scaffolding, tools, equipment, and coating, and thinner containers, and excess coating, and thinners, and other objectionable materials.

C. Dispose of such materials away from the site of work and in conformance with all applicable codes, ordinances and regulations.

D. Remove coating spots upon adjacent surfaces.

E. Clean, repair or refinish all damage to surfaces resulting from the work.

3.10 WARRANTY INSPECTION

A. Conduct a warranty inspection of all coating and painting work between the period of eleventh (11th) month through eighteenth (18th) month following final acceptance of the Contract work.

B. The Owner will establish the date for the inspection and will notify the Contractor at least 30 days in advance. The Owner may, by written notice to the Contractor, reschedule the warranty inspection to another date within the eleventh through eighteenth month inspection period, or may cancel the warranty period altogether.

C. Attendance

1. Attend the warranty inspection.

2. Notifying directly involved parties of the date and time of the inspection.

3. The Owner suggests personnel present at the pre-construction conference be present at this inspection.

D. Preparation

1. The Owner will completely drain and hose clean sufficiently for inspection.

2. Provide (Contractor) suitable lighting, ventilation and scaffolding for the structure inspection.

3. Use SSPC – Guide 12 for Illumination, and provide a minimum of 200 candle foot illumination for inspection.

E. Inspect visually the entire interior and exterior coating systems to determine whether any repair work is necessary or if a more detailed inspection will be needed.

F. Inspection Report

1. The Owner will prepare and deliver to the Contractor an Inspection Report.

   a. The report will cover the warranty inspection, setting forth the number and types of failures observed, the percentage of the surface area where failure has occurred, and the names of the persons making the inspections.

   b. Color photographs illustrating each type of failure will be included in the report.

   c. A coating system failure is defined as any location where coatings have peeled off, bubbled, or cracked, and any location where rusting is evident.

   d. Upon completion of inspection and receipt of Inspection Report, the Owner will establish a date for the Contractor to proceed with remedial work.

G. Commence repairs on the date established by the Owner and completed within one month (thirty days).

1. Repair all coating system failures.

   a. Remove the deteriorated coating, clean the surface and recoat with the same coating system in strict accordance with the specification and manufacturer's recommendations, to the satisfaction of the Owner.

   b. If the area of failure exceeds twenty five (25) percent of the area of a portion of the structures surface, then remove the entire coating system and recoat that surface. All costs for warranty inspection are the responsibility of the Contractor. Additional inspection and all costs for repair are the responsibility of the Contractor.

H. If the Contractor fails to complete the remedial work to the satisfaction of the Owner, the Owner may elect to perform the remedial work. The Contractor is liable for actual cost of all such remedial work, plus 20% for Owner’s administrative cost.

I. Perform final cleanup in accordance with this Section.

END OF SECTION

SECTION 11 05 13

ELECTRIC MOTORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Low-voltage alternating current induction motors, 250 horsepower or less.

B. This section does not specify medium voltage (over 600 volts) motors and specialty motors such as submersible motors, hoist motors, valve operator motors or torque rated motors.

C. Unless specified otherwise, require electric motors to be provided by the manufacturer of the driven equipment per of Section 46 05 13.

D. Unless specified otherwise in the particular equipment specifications, comply with these specifications.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 01 66 00 – Material and Equipment
3. Section 01 78 23 – Operation and Maintenance Data
4. Section 01 99 00 – Referenced Forms
5. Section 46 05 13 – General Requirements for Equipment

1.03 QUALITY ASSURANCE

A. Unit Responsibility

1. Comply with Section 46 05 13.
2. Unless otherwise specified, assign unit responsibility for motors to the individual manufacturers of the driven equipment.

B. Product Delivery, Storage, and Handling

1. Comply with Section 01 66 00.

C. Basic Standards

1. Manufacture per UL 674, UL 1004, NEMA Standard MG 1, and the requirements specified.

1.04 ENVIRONMENTAL CONDITIONS

A. Refer to individual equipment sections and drawings for installation locations.

1.05 SUBMITTALS

A. Comply with Section 01 33 00.

B. Include a copy of the contract document control diagrams and process and instrumentation diagrams, with addenda updates, that apply to equipment in this section.

1. Mark to show specific changes necessary for the equipment proposed in submittal.

2. If no changes are required, mark the drawing or drawings “No Changes Required”.

3. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

C. Include the following items:

1. Completed Motor Data Form (Section 01 99 00).

2. For motors 100 horsepower and larger, a motor heating curve.

3. Motor outline, dimensions, and weight.

4. Manufacturer's descriptive information relative to motor features.

5. Where a winding over-temperature device is required, provide a response curve for the temperature device.

6. For all inverter duty motors, the motor manufacturer's certification that the motor is compatible with the adjustable frequency drive to be used with the motor as specified in this section.

7. Motor performance data showing motor full load current, efficiency, and power factor for the motor operating at 25, 50, 75, 100 and 125 percent of full load.

8. Operating and maintenance information specified in Section 01 78 23.

9. Overhaul instructions for each motor 5 horsepower and above.

1.06 DESIGN REQUIREMENTS

A. NEMA “B” design, unless otherwise specified.

B. NEMA Class B temperature rise above 40 degrees C ambient.

1.07 WARRANTY

A. Provide two year warranty from date of substantial completion unless manufacturer’s standard warranty is longer.

B. Complete the Extended Warranty Form in Section 01 99 00.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. General

1. The Owner and Construction Manager believe the following candidate manufacturers are capable of producing equipment and/or products that will satisfy the requirements of this section.

2. Do not construe the preceding statement, as an endorsement of a particular manufacturer's products or that named manufacturers' standard equipment or products will comply with the requirements of this section.

3. The below listed manufacturer's motors generally meet the class and performance requirements of this specification when furnished with appropriate modifications and additional features as specified.

B. Horizontal Motors

1. Types 1 and 2 – Premium efficiency motors manufactured by General Electric Inc., Type KS; and Reliance Electric Co., Type XEX, or equal.

2. Type 3 – Premium efficiency explosionproof motors manufactured by General Electric Inc., Type KS, Class I, Group D; and Emerson US Motor, Type LCE, or equal.

C. Vertical Motors

1. Types 1 and 2 – Premium efficiency motors manufactured by General Electric Inc., Type KS; and Emerson US Motors, Type TUCE Corroduty, or equal.

2. Type 3 – Premium efficiency explosionproof motors manufactured by General Electric Inc., Type KS, Class I, Group D; and Emerson US Motors, Type LUCE, or equal.

D. Inverter Duty Motors

1. Baldor, Inverter Motor; General Electric, ASD; Reliance, RPM-AC (XT) and US Motors Varidyne Inverter Duty, or equal.

2.02 MATERIALS

A. Cast iron frames for motors 1/2 horsepower and larger. Steel frames for motors smaller than 1/2 horsepower. Aluminum frame motors will not be permitted.

B. Cast metal fan blades and shrouds.

C. Stainless steel hardware.

D. Nonhygroscopic leads.

2.03 NAMEPLATES

A. Material: Engraved or stamped stainless steel or brass.

B. Information: Include items listed in NEMA Standard MG 1, Paragraph 10.37, 10.38 or 20.60, as applicable.

C. For motors 1/2 horsepower and larger, indicate the ABMA L-10 rated life for the motor bearings.

D. For motors 2 horsepower and larger, list the nominal efficiency.

E. For explosionproof motors, indicate UL frame temperature limit code.

F. Permanently fasten to the motor frame and position for easy visible inspection.

2.04 MOTORS LESS THAN 1/2 HORSEPOWER

A. General

1. Type: Squirrel cage, single phase, capacitor start, induction run type.
2. The equipment manufacturer may provide normally supplied materials in lieu of those specified in Paragraph 2.02
3. For single phase motors provide Class B insulation.
4. Small fan motors may be split-phase or shaded-pole type.
5. Provide with copper windings.

B. Rating

1. 115 volts, single phase, 60 hertz.
2. Continuous-time rated per NEMA Standard MG 1, Paragraph 10.35.
3. Nonoverloading at all points of the equipment operation.

C. Enclosures

1. Comply with NEMA MG 1.
2. Unless otherwise specified, provide totally enclosed fan cooled or totally enclosed nonventilated enclosures.
3. Explosion Proof Motors
   a. Furnish with UL Label for Class I, Division 1, Group D hazardous locations.
   b. Provide an over temperature device in the enclosure to detect and automatically de-energize the motor if the enclosure surface temperature exceeds 260 degrees C.
   c. Mark nameplate with UL frame temperature limit code T2B.

2.05 MOTORS 1/2 HORSEPOWER THROUGH 250 HORSEPOWER

A. General

1. Type: Three phase, squirrel cage, full voltage start induction type.
2. Unless otherwise specified, provide a NEMA MG 1-1.16 design for the duty service imposed by the driven equipment such as frequent starting, intermittent overload, high inertia, mounting configuration, or service environment.

B. Rating

1. 460 volts, three phase, 60 Hz.
2. Continuous time rated per NEMA Standard MG 1, paragraph 10.40.
3. Unless specified otherwise, provide a service factor of 1.15, but size not to exceed the nameplate rating at any point on the operating curve (non-overloading) of the driven equipment.

C. Classifications

1. General:

   a. Comply with the requirements specified in the following paragraphs.

   b. Definition of terms: Per NEMA MG 1.

   c. Temperature rise: for all motor types, do not exceed that permitted by Note II, paragraph 12.42, NEMA MG 1. The insulation shall be nonhygroscopic.

2. Type 1 Motors:

   a. Drip-proof guarded enclosures

   b. Class F insulation and Class B temperature rise at the motor's nominal rating.

3. Type 2 Motors:

   a. Totally enclosed, fan cooled.

   b. Class F insulation and Class B temperature rise at the motor's nominal rating.

   c. Conform to IEEE 841.

   d. Coat all internal surfaces with an epoxy paint.

4. Type 3 Motors

   a. Explosion proof motors, UL listed per UL 674 for Class I, Group D hazardous atmospheres.

   b. Class F insulation.

   c. Conform to IEEE 841.

   d. Provide UL-approved breather/drain device in the motor drain hole.

   e. Provide a frame temperature thermostat which meets the UL frame temperature limit code T2B (260 degrees C). Include automatically reset, normally closed contact rated 2 amperes at 115 volts AC.

D. Thermal Protection

1. Unless specified otherwise, provide thermal protection as defined in NEMA MG 1-12.53.1, as follows:

Motor type	Thermal Protection	
	Type 2 - Thermostats	Type 1 - RTDs
Noninverter duty	50-150 HP	200-250 HP
Inverter duty	1-60 HP	75-250 HP

2. Provide thermal protection in each stator winding.

   a. Thermostats: Bimetallic switch type, self-resetting.

   b. Resistance temperature detectors (RTDs): 10-ohm copper type (two per phase).

   c. On larger frame sizes where the motor manufacturer does not offer copper type RTDs, provide 100-ohm platinum type (two per phase).

3. For explosion proof motors, provide the motor winding thermal protection as specified above in addition to the motor frame thermostat specified in Paragraph 2.05.c.4.e.

E. Inverter Duty Motors

1. Use with adjustable frequency controllers employing Pulse Width Modulation (PWM) technology.

2. Do not exceed NEMA MG 1, Class B, temperature rise when operating over the specified speed range on the specified load speed/torque characteristics required by the associated driven equipment

3. Provide certification from the motor manufacturer of compatibility with the adjustable frequency controller to be used with the motor.

4. Designed to operate over the speed or frequency range specified.

5. Insulation: Meet NEMA MG 1, Part 31 (1600 volt peak at a minimum of 0.1 microsecond rise time).

6. Provide with thermal protection as specified above.

7. Provide Grounding Unit

   a. Provide with a shaft grounding unit mounted on the fan housing with stub shaft extended from the motor shaft.

   b. Equip with two brushes, totally enclosed and sealed against environmental contamination.

   c. Exception: Grounding unit and brushes not required for vertical turbine pumps.

8. Totally Enclosed, Air-Over, Blower-Cooled (TEBC) Type

   a. Provide where specified or required by the specified application requirements.

   b. Blowers: Driven at constant speed by 460-volt, 3-phase motors meeting Type 2 requirements specified in Paragraph 2.04 C.3.

   c. Manufacture blower and ducting as an integral part of the main motor frame.

   d. Provide air intake filter.

   e. Construct scroll case of cast aluminum or iron, and fan wheel of Type 304 stainless steel.

9. Inverter duty motors may be NEMA MG1-1.16, design A.

F. Vertical Motors

1. Provide solid-shaft P-base type specifically designed for vertical installation.

2. Universal position motors are not acceptable.

3. Comply with Type 2, Type 3, and/or Inverter Duty Motor requirements as specified.

4. Thrust bearing rating: Demonstrate compatibility with the loads imposed by the driven equipment.

G. Minimum Nameplate Efficiency

1. Determine per IEEE 112B testing procedures, when operating on a sinusoidal power source.

2. Comply with the following:

Motor Horsepower	Motor Minimum Efficiency, percent			
	900 rpm	1200 rpm	1800 rpm	3600 rpm
1	72.0	82.5	83.0	84.0
1.5	75.5	84.0	85.0	84.0
2	81.5	85.5	82.5	82.5
3	86.5	88.5	89.5	87.5
5	87.5	89.5	89.5	89.1
7.5	88.5	91.0	91.7	90.2
10	89.5	91.1	91.7	91.0
15	89.8	91.7	92.4	91.7
20	90.2	91.7	93.0	91.7
25	91.0	92.4	93.5	92.0
30	91.0	93.0	93.6	92.4
40	91.7	93.6	94.1	93.0
50	92.4	93.6	94.1	93.0
60	93.0	93.9	94.5	93.6
75	93.0	94.5	95.0	94.1
100	93.6	94.5	95.4	94.5
125	94.5	94.5	95.4	94.9
150	94.5	95.4	95.8	95.0
200	94.5	95.4	95.8	95.4
250	94.5	95.4	95.8	95.4

H. Conduit Boxes

1. Type: Cast iron, split construction with threaded hubs.

2. Conform to IEEE 841.

3. Furnish at least one size larger than NEMA standard for the given motor size.

4. Design to rotate in order to permit installation in any of four positions 90 degrees apart.

5. Furnish with petroleum-resistant gaskets at the base of the conduit box and between the halves of the conduit box.

6. Provide grounding lug located within the box for the ground connection.

7. Minimum length of pigtail leads:

   a. 12 inches for motors up to 50 horsepower.

   b. 16 inches for motors larger than 50 to 250 horsepower.

I. Bearings

1. Type: Oil or grease lubricated ball or angle contact roller bearings.

2. Rating: Minimum L-10 life of 100,000 hours per ABMA 9 or 11 at the ambient temperature specified.

3. Motor designs employing cartridge type bearings will not be accepted.

4. Fit with lubricant fill and drain or relief fittings.

J. Lifting Eyes

1. Fit motors weighing more than 50 pounds with at least one lifting eye.

K. Current Imbalance

1. Base upon the lowest value measured.

2. Do not exceed the values tabulated below when the motor is operating at any load within its service factor rating and is supplied by a balanced voltage system:

   a. Under 5 horsepower: 25 percent

   b. 5 horsepower and above: 10 percent

L. Space Heaters

1. Where specified, size and design to prevent condensation inside the motor enclosure after shutdown.

2. Type: Cartridge or flexible wraparound type.

3. Power Requirements: 120 volts, single phase, 60 Hz.

4. Mark the rating in watts and volts on the motor nameplate or on a second nameplate.

5. Bring terminals to a separate terminal block or to pigtails in the conduit box.

PART 3 - EXECUTION

3.01 TESTING

A. Perform winding insulation resistance and current imbalance testing as specified in Division 16.

B. Test for correct rotation during preoperational checkout.

END OF SECTION

SECTION 40 61 96.13

PROCESS CONTROL DESCRIPTIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Instrumentation control loops.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 01 78 23 – Operation and Maintenance Data

1.03 SYSTEM DESCRIPTION

A. The control loop descriptions provide the functional requirements of the control loops represented in the Contract Documents.

B. Descriptions are provided as follows:

1. Control system overview and general description.
2. Major equipment to be controlled.
3. Major field mounted instruments (does not include local gages).
4. Manual control functions.
5. Automatic control functions/interlocks.
6. Major indications provided at local control panels and motor starters/VFD's.
7. Remote indications and alarms.

C. The control loop descriptions are not intended to be an inclusive listing of all elements and appurtenances required to execute loop functions, but are rather intended to supplement and complement the Drawings and other Specification Sections.

1. The control loop descriptions shall not be considered equal to a bill of materials.

D. Provide instrumentation hardware and software as necessary to perform control functions specified herein and shown on Drawings.

1.04 SUBMITTALS

A. See Section 01 33 00 for requirements for the mechanics and administration of the submittal process.

B. Contract Closeout Information:

1. Operation and Maintenance Data:

a. See Section 01 78 23 for requirements for the mechanics, administration, and the content of Operation and Maintenance Manual submittals.

C. Control Strategy for Record Documents:

1. Obtain this Specification Section in electronic format (Microsoft Word) from Engineer at beginning of Project.

2. Revise and update the file monthly during construction and start-up to reflect all changes that occur due to specific equipment and systems supplied on the Project.

a. Show all revisions in 'track change' mode.

b. Change Specification Section Title to read "Control Loop Descriptions - Contractor Record Document."

c. Reference all changes by Request for Information (RFI) number or Change Proposal Request (CPR) number.

d. Submit revised file monthly to Engineer for review.

D. Deliver the revised and updated file as a final control loop description Record Document in the Operation and Maintenance Manual described in Specification Section 01 78 23.

E. Provide both paper copy and electronic copy (on CD-ROM) of the Record Document control loop descriptions in the Operation and Maintenance Manual described in Specification Section 01 78 23.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.01 CONTROL LOOPS

A. This Section includes control loops for Phase 1. The Phase 1 package that each control loop is associated with is noted below. Programming and other work associated with Phase 1 control loops shall not be included in the bid price for Phase 2.

CONTROL STRATEGY 11 – DEWATERING SCREW PRESS SYSTEM

1.1 REFERENCES

A. Drawings:
   1. M-XXX
   2. E-XXX
   3. I-XXX

B. Specifications:
   1. Section 46 XX XX

1.2 SYSTEM COMPONENTS

A. Major Equipment and Related Devices
   1. Conditioning Tank
      a. Mixer: MIX-250-01
      b. Level Switch: LSH-250-01
   2. Dewatering Screw Press
      a. Screw Press: DEW-250-02
      b. Level sensor: LE-250-02
      c. Level indicator/transmitter: LIT-250-02
   3. Conveyors
      a. Conveyors: CON-250-03, CON-250-04, CON-250-05
      b. Zero speed switches SSL-250-03, SSL-250-04, SSL-250-05
      c. Emergency stop hand cables HS-250-03, HS-250-04, HS-250-05

B. Knife gate valve with motorized actuator
      a. Kinfe gate valve: KGV-250-01
      b. LOCAL/OFF/REMOTE selector switch
      c. OPEN/CLOSE selector switch

C. Spray water control devices
   1. Motorized ball valves: VLV-250-XX, VLV-250-XX, VLV-250-XX
   2. Flow switches: FS-250-XX, FS-250-XX, FS-250-XX

D. Flow Instruments
   1. Digested Sludge Flow Meter/Transmitter FE/FIT-250-00

E. Local Control Station
   1. Panel: LCS-250-01
   2. LOCAL/OFF/REMOTE selector switches: HS-250-01, HS-250-02, HS-250-03, HS-250-04, HS-250-05
   3. START and STOP push buttons: PB-250-01B, PB-250-02B, PB-250-03B, PB-250-04B, PB-250-05B, PB-250-01C, PB-250-02C, PB-250-03C, PB-250-04C, PB-250-05C
   4. FAST STOP push buttons: PB-250-01A, PB-250-02A, PB-250-03A, PB-250-04A, PB-250-05A
   5. SPEED selector dials: XX-250-XX, XX-250-XX
   6. Running & Fault Lights: YL-250-01A, YL-250-02A, YL-250-03A, YL-250-04A, YL-250-05A, YA-250-01A, YA-250-02A, YA-250-03A, YA-250-04A, YA-250-05A

F. MCC Devices:
   1. Variable Speed Drives: VFD-250-01, VFD-250-02

G. Motor Starters: MS-250-03, MS-250-04, MS-250-05

1.3 SYSTEM INTEGRATOR SCOPE

A. All PLC and SCADA programming shall be furnished and installed by the Owner's System Integrator. All references within this document that include System Integrator's scope shall be considered for

reference only by the Contractor. The scope shall include the following:

1. PLC and SCADA software and programming
2. Operator Interface Terminal and SCADA workstation screen development and programming.

1.4 DESCRIPTION

The Dewatering Facility consists of the following components:

- Digested sludge flow meter
- Conditioning tank with mixer
- Screw press
- Polymer blending unit
- Screw press water spray system with control valve
- Inclined shaftless screw conveyor between the screw press and primary dumpster with two discharge points and an isolation knife gate on the most upstream discharge point
- A horizontal shaftless screw conveyor between the most upstream discharge point on the inclined conveyor and the standby dumpster
- A lidding system on the primary dumpster that has a built-in shaftless screw conveyor, a hinge assembly on one side of the lid, and hoist to lift the other end of the lid

When the digested sludge pump turns on and a flow signal is detected at the digested sludge flow meter, the polymer blending unit shall turn on and begin pumping polymer into the conditioning tank. The conditioning tank mixer shall also turn on. The polymer blending unit shall operate as described in Control Strategy 12. The conditioning tank mixer shall operate at an operator adjustable speed.

Digested sludge mixed with polymer will flow from the conditioning tank into the screw press head box. When the level in the screw press headbox reaches an operator adjustable setpoint, the screw press shall turn on and operate in either Constant Flow Mode or Variable Flow Mode as described below. In Constant Flow Mode, the digested sludge and polymer flow are constant, but the screw press speed varies to maintain level in the screw press headbox. In Variable Flow Mode, the screw press speed is constant, but the digested sludge and polymer flow are varied to maintain level in the screw press headbox.

When the screw press is running, the three spray water control valves shall open one at a time in series. The first valve shall open for an operator adjustable length of time (e.g. 5 – 15 minutes) then close. The next valve shall open for an operator adjustable length of time (e.g. 5 – 15 minutes) then close. The final valve shall open for an operator adjustable length of time (e.g. 5- 15 minutes). Then the cycle shall repeat.

When the screw press is running, the inclined conveyor shall also be running, and the inclined conveyor knife gate valve shall be in the open position. The inclined conveyor knife gate valve and horizontal conveyor are controlled in local/manual mode only and are normally not in use. These pieces of equipment will be used when the primary dumpster is taken of service and the standby dumpster is being used. The dumpster lidding system hoist is also controlled in local/manual mode only independently of the PLC. The hoist is used to lift the lid up when the primary dumpster needs to be removed from the building.

There shall be two shutdown modes for the Dewatering Screw Press System: Auto Shutdown and Immediate Shutdown. In Auto Shutdown Mode the equipment shall be shut down as follows: the polymer system shall stop, the sludge feed pump shall stop, the flocculation tank mixer shall stop, the screw press shall continue running for an operator adjustable amount of time then turn off, and the inclined conveyor shall continue running for an operator adjustable amount of time then turn off. In Immediate Shutdown Mode all equipment shall turn off immediately.

The following conditions/alarms shall trigger Auto Shutdown Mode: sludge feed pump fault, sludge feed low flow, polymer system fault, flocculation tank mixer VFD fault, flocculation tank High-High level, screw press head box High-High level. The following conditions/alarms shall trigger Immediate Shutdown mode: screw

press motor VFD fault, conveyor motor fault, conveyor E-stop pull cord activated, conveyor zero speed switch trip, any equipment FAST stop push button activated.

1.5 LOCAL MANUAL OPERATION

Local manual operation of the conditioning tank, screw press, inclined conveyor, conveyor knife gate valve, lidding system conveyor, and horizontal conveyor can be initiated by using the LOCAL/OFF/REMOTE selector switches for each piece of equipment on the local control station in the dewatering area. The equipment can then be operated using the START/STOP pushbuttons, OPEN/CLOSE push buttons, and SPEED selector dials on the local control station.

Local manual operation of screw press spray water valve can be initiated using the local manual override on the valve.

1.6 REMOTE MANUAL OPERATION

Remote manual operation of the conditioning tank, screw press, screw press spray water control valve, inclined conveyor, conveyor knife gate valve, lidding system conveyor, and horizontal conveyor can be initiated by setting the LOCAL/OFF/REMOTE selector switches for each piece of equipment on the local control station in the dewatering area to REMOTE. Then, from the Dewatering Facility graphic display screen on the SCADA system, the MANUAL/AUTO selector switch for each piece of equipment should be toggled to MANUAL. The equipment can then be controlled with the controls on the SCADA control screen.

1.7 REMOTE AUTOMATIC OPERATION

Remote automatic operation of the conditioning tank, screw press, screw press spray water control valve, inclined conveyor, and lidding system conveyor can be initiated by setting the LOCAL/OFF/REMOTE selector switches for each piece of equipment on the local control station in the dewatering area to REMOTE. Then, from the Dewatering Facility graphic display screen on the SCADA system, the MANUAL/AUTO selector switch for each piece of equipment should be toggled to AUTO. The equipment will then be controlled as described in Section 1.3.

1.8 SUMMARY OF LOOP FUNCTIONS

A. Refer to the I/O list, P&IDs, and PLC drawings.

1.9 SCADA SCREENS

A. Digested Sludge Flow Indication

B. Conditioning Tank High Level Indication

C. Conditioning Tank Mixer VFD Ready Indication

D. Conditioning Tank Mixer VFD Running Indication

E. Conditioning Tank Mixer VFD in Remote Indication

F. Conditioning Tank Mixer VFD Fault Indication

G. Conditioning Tank Mixer VFD Fast Stop Indication.

H. Conditioning Tank Mixer VFD Start Command Indication

I. Conditioning Tank Mixer VFD Speed Command Indication

J. Conditioning Tank Mixer VFD Speed Feedback Indication

K. Screw Press Head Box Level Indicator

L. Screw Press VFD Ready Indicator

M. Screw Press VFD Running Indicator

N. Screw Press VFD in Remote Indicator

O. Screw Press VFD Fault Indicator

P. Screw Press VFD FAST STOP

Q. Screw Press VFD Start Command Indicator

R. Screw Press VFD Speed Command Indicator

S. Screw Press VFD Speed Feedback Indicator

T. Conveyor Zero Speed Indicator

U. Conveyor E-Stop & Pull Cord Indicator

V. Conveyor Motor Running Indicator

W. Conveyor Motor in Remote Indicator

X. Conveyor Motor Fault Indicator

Y. Conveyor Motor Fast Stop Indicator

Z. Conveyor Motor Start Indicator

1.10 HISTORICAL TRENDING

A. Digested Sludge Flow

B. Screw Press Head Box Level

C. Screw Press Run Time hours

D. Conveyor Run Time Hours

1.11 ALARMS

A. Digested Sludge Flow Meter LOW FLOW

B. Digested Sludge Flow Meter OUT OF RANGE

C. Digested Sludge Flow Meter LOSS OF COMMUNICATIONS

D. Conditioning Tank Mixer VFD FAULT. Reset by pressing the reset pusbutton on the VFD. Additionally, the fault may be reset by placing the LOR selector switch at the Local Control Station in the OFF position

E. Conditioning Tank HIGH LEVEL switch.

F. Screw Press VFD FAULT. Reset by pressing the reset pusbutton on the VFD. Additionally, the fault may be reset by placing the LOR selector switch at the Local Control Station in the OFF position.

G. Screw Press FAST STOP.

H. Screw Press Head Box HIGH LEVEL

I. Conveyor E-STOP & PULL CORD

1.12 INTERLOCKS

A. The Conditioning Tank Mixer FAST STOP switch is hardwired to the Conditioning Tank Mixer VFD.

B. The Screw Press FAST STOP switch is hardwired to the Screw Press VFD.

C. The Conveyor E-STOP switches and PULL CORDS are hardwired to the Conveyor Motors.

END OF SECTION

CONTROL STRATEGY 12 – POLYMER BLENDING UNIT

2.1 REFERENCES

A. Drawings:
   1. M-XXX
   2. E-XXX
   3. I-XXX

B. Specifications:
   1. Section 46 XX XX

2.2 SYSTEM COMPONENTS

A. Major Equipment and Related Devices:
   1. Polymer storage tote
   2. Polymer system skid POL-250-04
   3. Polymer feed pump PMP-250-XX
   4. Mixing Chamber XXX-250-XX
   5. Mixer MIX-250-XXX

B. Pressure and Flow Devices:
   1. Pressure Indicators: PI-250-04, PI-250-05
   2. Flow Switches: FSL-250-XX, FSL-250-XX
   3. Flow Indicators: FI-250-04, FI-250-XX

C. Potable water dilution water piping assembly
   1. Pressure regulating valve
   2. Pressure Indicator PI-250-XX
   3. Water control valve SV-250-04

D. Vendor supplied local control station
   1. Panel: LCS-250-04
   2. LOCAL/OFF/REMOTE selector switch: HS-250-04
   3. START and STOP push buttons: PB-250-XX, PB-250-XX
   4. Pump SPEED selector dial: XX-250-XX
   5. Power ON, System RUNNING, and FAULT lights: YL-250-XX, YL-250-XX, YA-250-XX
   6. Fast Stop pushbutton: PB-250-XX
   7. Polymer flow readout

E. Shower and Eye Wash
   1. Flow Switch FS 800-01

2.3 SYSTEM INTEGRATOR SCOPE

A. All PLC and SCADA programming shall be furnished and installed by the Owner's System Integrator. All references within this document that include System Integrator's scope shall be considered for reference only by the Contractor. The scope shall include the following:
   1. PLC and SCADA software and programming
   2. Operator Interface Terminal and SCADA workstation screen development and programming.

2.4 DESCRIPTION

The polymer blending unit in the Dewatering Facility consists of the following components:

- Polymer system skid with polymer feed pump, mixing chamber, dilution water control valve, and associated piping, valves, and instruments
- Polymer storage tote

- Potable water dilution water piping

When the digested sludge pump turns on and a flow signal is detected at the digested sludge flow meter, the polymer blending unit shall be called to run and controlled via the vendor supplied panel for the polymer blending unit. The panel shall operate the polymer feed pump, potable dilution water control valve, and mixer to achieve an operator adjustable target polymer dose based on the digested sludge flow rate and operator adjustable stored polymer concentration. The local control station shall monitor the feed pump flow switch and dilution water flow switch and alarm if flow is detected below and operator adjustable set point. The feed pump shall turn off and the potable water dilution water control valve shall shut in response to these alarms.

2.5 LOCAL MANUAL OPERATION

Local manual operation of the polymer blending unit can be initiated by using the LOCAL/OFF/REMOTE selector switch on the vendor supplied local control panel to LOCAL. The system can then be controlled using the START/STOP pushbuttons and SPEED selector dials on the panel. Dilution water flows can be adjusted manually using the rotary valves and rotameters on the polymer skid.

2.6 REMOTE MANUAL OPERATION

Remote manual operation of the polymer blending unit can be initiated by setting the LOCAL/OFF/REMOTE selector switch on the vendor supplied local control panel to REMOTE. Then, from the Dewatering Facility graphic display screen on the SCADA system, the MANUAL/AUTO selector switch for each piece of equipment should be toggled to MANUAL. The equipment can then be controlled with the controls on the SCADA control screen.

2.7 REMOTE AUTOMATIC OPERATION

Remote automatic operation of the polymer blending unit can be initiated by setting the LOCAL/OFF/REMOTE selector switch on the vendor supplied local control panel to REMOTE. Then, from the Dewatering Facility graphic display screen on the SCADA system, the MANUAL/AUTO selector switch for each piece of equipment should be toggled to AUTO. The equipment will then be controlled as described in Section 1.3.

2.8 SUMMARY OF LOOP FUNCTIONS

A. Refer to the I/O list, P&IDs, and PLC drawings.

2.9 SCADA SCREENS

A. Polymer System Set Point

B. Polymer System Running Indicator

C. Polymer System in Remote Indicator

D. Polymer System Speed Control Indicator

E. Polymer System Remote Start Indicator

F. Polymer System Flow Fault Indicator

G. Polymer System Fast Stop Indicator

2.10 HISTORICAL TRENDING

A. Polymer System run time hours

2.11 ALARMS

A. Polymer System FLOW FAULT

B. Shower / Eyewash Flow Switch WATERFLOW ALARM

2.12 INTERLOCKS

A. The FAST STOP switch on the Polymer System Control Panel is hardwire interlocked to the starter in the control panel.

END OF SECTION

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SECTION 40 78 00

PANEL MOUNTED EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements pertaining to the construction and installation of the control panels.

1.02 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. National Electrical Contractors Association (NECA)
2. National Electrical Installation Standard (NEIS)
    a. 5055, Standard of Installation
3. National Fire Protection Association (NFPA)
    a. 70, National Electrical Code (NEC)
    b. 79, Electrical Standard for Industrial Machinery
4. Underwriters Laboratories, Inc. (UL)
    a. 3121-1, Standard for Safety for Process Control Equipment
    b. 508, Industrial Control Equipment
    c. 698A, Standard for Industrial Control Panels Relating to Hazardous (Classified) Locations
5. National Electrical Manufacturer's Association (NEMA)
    a. 250, Enclosures for Electrical Equipment
    b. ICS 1-2000, Industrial Control and Systems General Requirements

1.03 SUBMITTALS

A. Contractor shall submit all the product data in Division 40 at the same time. Piecemeal submittals will be rejected as incomplete.

B. Submittal Format:

1. The product data shall be provided as individual PDFs for each Section, unless otherwise noted for specific items. Each PDF shall be numbered to match the specification Section numbers. Submittals not itemized and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260000.A01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.

3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

4. Submittals in PDF shall include an index, table of contents, or bookmarks with hyperlinks to the associated page of all submitted items. Index shall include each product specified with their corresponding Reference Keynote Number. Electronic submittals not containing a linked index, table of contents, or bookmarks will be rejected as incomplete.

C. Product Data

1. Pursuant to Section 01 33 00 – Submittals.

2. Manufacturer's data including materials of construction, methods of installation and related information for each item specified in PART 2 PRODUCTS.

D. Shop Drawings

1. Dimensional drawings showing the overall length, width, and height of the assembled control panel. Included on these drawings shall be the back panel layout of installed control devices showing part numbers, dimensions, nameplate text, and other details required for a complete assembly. The CONTRACTOR shall obtain the Drawings for the control panel layout and schematic from the ENGINEER. The CONTRACTOR shall modify the Drawings as required for submittal and for as-built documentation. The CONTRACTOR shall not generate their own drawings.

2. For large control panel, physical properties, handling, mounting, shipping break point locations shall be shown in submittal drawings. This shall include total weight, lifting instructions, height, and floor space required.

3. Provide electrical schematic drawings that include: wiring details such as internal and field connection terminal block numbers; shielded wire termination requirements; grounding requirements; and wire colors. Show all required internal and external interlocking. Each drawing shall be circuit specific for the system submitted. No typical schematic drawings shall be submitted.

4. Drawings shall list the equipment number of the box, control panel, or center submitted.

5. Component designations shall match those shown on the Drawings.

6. Complete bills of materials shall be included with submittal.

1.04 QUALITY ASSURANCE

A. Qualifications

1. Equipment provided as part of this section shall be manufactured by a single licensed firm, regularly engaged in the design and manufacture of such equipment for a minimum of five years. The control panels shall have a UL508A listing. Components within control panels shall be listed in a manner consistent with UL508A requirements.

1.05 MAINTENANCE

A. Manufacturer shall provide and list in the bill of materials the following spare parts.

1. One each of all power and control fuses provided in the assembled control panel/ center.

B. Provide Operation and Maintenance Data and Manuals Pursuant to the Contract Documents.

PART 2 - PRODUCTS

2.01 COMPONENTS

A. Stainless Steel, NEMA 4X Enclosures (407800.E01).

1. Enclosures shall be provided as shown on the Drawings.

2. Enclosures shall be provided with accessories as shown on the Drawings and as specified below.

3. Enclosures in damp, wet, corrosive, or outdoor locations shall be: constructed of stainless steel (NEMA 4X) with zinc electroplated (galvanized) steel back-panel; continuous hinged with gasketed doors and screw down clamps.

4. Provide manufacturer supplied swing-out deadfront door within the enclosure.

5. Enclosures in outdoor locations shall be equipped with a hasp and staple for padlocking.

6. Provide Hoffman enclosures, or approved equal.

B. Panel Vents (407800.V01).

1. Panel Vents shall be provided as shown on the Drawings.

2. Provide Hoffman number ANMV3, or approved equal.

C. Enclosure Heater (407800.H17).

1. Enclosure heaters shall be provided as shown on the Drawings.

2. Enclosure heaters shall operate on 115 VAC.

3. Enclosure heaters shall be provided with integral mounted thermostats.

4. For 100W heaters, provide Hoffman model DAH1001A, or approved equal.

5. For 200W heaters, provide Hoffman model DAH2001A, or approved equal.

D. Enclosure Lighting (407800.L01).

1. Enclosure lighting shall be provided as shown on the Drawings.

2. Enclosure lighting shall be LED.

3. Lamp shall be provided by CONTRACTOR.

4. Enclosure lighting shall be operated via a remote door switch.

5. Enclosure lighting shall be 115 VAC powered.

6. Provide Hoffman model LEDA1S35 light with door switch, or approved equal.

E. Power Circuit Breaker (407800.C02).

1. Power circuit breakers shall be provided as shown on the Drawings.

2. Power circuit breakers shall be current-limiting and designed to interrupt and isolate electrical power to individual power circuits and components deriving power from the enclosure.

3. Power circuit breakers shall be UL489 listed.

4. Power circuit breakers shall have the number of poles as indicated on the Drawings.

5. Power circuit breakers shall have current interruption ratings of 10K RMS symmetrical amperes, minimum, with voltage ratings and current trip ratings as shown on the Drawings.

6. Power circuit breakers shall have fast acting (type "B" trip curve), normal (type "C" trip curve) and high inrush (type "D" trip curve) trip characteristics as dictated by the connected load.

7. Power circuit breakers shall be panel mounted on DIN rail.

8. Power circuit breakers shall include a positively trip-free mechanism that cannot be defeated by holding the handle in the ON position.

9. Power circuit breakers shall be wire connected and include terminal lugs.

10. Provide Eaton Cutler-Hammer type FAZ-NA, or approved equal.

F. Power Circuit Breaker Accessories (407800.C04).

1. Provide busbar for one-pole, two-pole or three-pole circuits when shown on the Drawings. The busbar shall be the same manufacturer as the power circuit breaker. Provide Eaton Cutler-Hammer busbar catalog number Z-SV/UL-16/__-___/_, or approved equal.

2. Provide busbar shroud on all unused terminals. The shroud shall be the same manufacturer as the busbar.

3. Provide Eaton Cutler-Hammer busbar shroud catalog number ZV-BS-UL, or approved equal.

4. Provide a bus connector to supply the power feed to the bus bar as shown on the Drawings. The bus connector shall be the same manufacturer as the busbar.

5. Provide Eaton Cutler-Hammer bus connector catalog number Z-EB/50/UL, or approved equal.

G. Motor Circuit Protector (407800.C05).

1. Motor circuit protectors shall be provided as shown on the Drawings.

2. Motor circuit protectors shall be energy-limiting and designed to interrupt and isolate electrical power to individual power circuits and components deriving power from the enclosure.

3. Motor circuit protectors shall be UL489 listed.

4. Motor circuit protectors shall have the number of poles as indicated on the Drawings.

5. Motor circuit protectors shall have current interruption ratings of 10K RMS symmetrical amperes, minimum, with voltage ratings and current trip ratings as shown on the Drawings.

6. Motor circuit protectors shall have fast acting, normal and high inrush trip characteristics as dictated by the connected load.

7. Motor circuit protectors shall be panel mounted.

8. Motor circuit protectors shall include a positively trip-free mechanism that cannot be defeated by holding the handle in the ON position.

9. Motor circuit protectors shall be wire connected and include terminal lugs.

10. Provide Cutler-Hammer type HMCP, or approved equal.

H. Miniature "Ice Cube" Relays (24 VDC) (407800.R05).

1. Provide relays as shown on Drawings.

2. Relays shall be industrial plug-in blade style with the on/off status indicated by either a neon or LED indicating light or by mechanical means.

3. Relays shall be Form C contacts with a minimum of 4 poles and 7-amp contact rating.

4. Relay coil voltage shall be 24VAC.

5. Provide with DIN rail mounting screw terminal socket and retainer clips.

6. Relay bases shall be of the same manufacturer as the relay.

7. Provide Allen-Bradley p/n 700-HC24A24 relays, p/n 700-HN104 screw terminal sockets, and p/n 700-HN114 retainer clips, or approved equal.

I. Time Delay Relays (407800.R12).

1. Time delay relays shall be provided as shown on the Drawings.

2. Time delay relays shall be either time delay on energize (TDOE), or time delay on de-energize (TDODE) as indicated on the Drawings.

3. Time delay relays shall be provided with a timing range as indicated on the Drawings.

4. Time delay relays shall be industrial plug-in blade style.

5. Time delay relays shall indicate the timed out status by either a neon indicating light, LED indicating light, or by mechanical means.

6. Time delay relays shall be provided with a minimum of three Form C contacts, and 10 Amp contact rating.

7. Time delay relay coil voltage shall be either 120 VAC or 24 VDC as indicated on the Drawings.

8. Time delay relays shall be provided with DIN rail mounting bases and hold down clips.

    a. Relay bases shall be of the same manufacturer as the relay.

9. Provide Idec RTE Series, or approved equal.

J. Control Fuses (407800.F01).

1. Control Fuses shall be provided as shown on the Drawings.

2. Control Fuses shall interrupt and isolate electrical power to individual control circuits and components within each enclosure and for circuits and components located outside each enclosure but deriving power from the enclosure.

3. Control Fuses shall be rated at 250 VAC minimum and with current ratings as shown on the Drawings.

4. Control Fuses shall have fast acting and time delay characteristics as dictated by the connected load.

5. Provide five (5) spare fuses of each type and size provided for each control panel.

6. Provide Ferraz-Shawmut type GGM, or approved equal.

K. Selector Switches (407800.S01).

1. Selector switches shall be provided as shown on the drawings.

2. Selector switches shall be of round construction with rotary operators.

3. Selector switches operation shall be to maintain the position turned to unless shown otherwise on the Drawings.

4. Selector switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.

5. Selector switch contacts shall be rated at 10 Amps.

6. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

L. Pushbutton Switch (407800.S02).

1. Pushbutton switches shall be provided as shown on the drawings.

2. Pushbutton switches shall be of round construction with push or push-pull operators.

3. Pushbutton switch operation shall be momentary or maintained as shown on the Drawings.

4. Pushbutton switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.

5. Pushbutton switch contacts shall be rated at 10 Amps.

6. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

M. Key Switches (407800.S03).

1. Key switches shall be provided as shown on the drawings.
2. Key switches shall be of round construction with rotary operators.
3. Key switches operation shall be to maintain the position turned to unless shown otherwise on the Drawings.
4. Key switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
5. Key switch contacts shall be rated at 10 Amps.
6. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

N. Mushroom Style Pushbutton Switch (407800.S04).

1. Mushroom Style Pushbutton switches shall be provided as shown on the drawings.
2. Mushroom Style Pushbutton switches shall be of round construction with push or push-pull operators.
3. Mushroom Style Pushbutton switch operation shall be momentary or maintained as shown on the Drawings.
4. Mushroom Style Pushbutton switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
5. Mushroom Style Pushbutton switch contacts shall be rated at 10 Amps.
6. Mushroom Style Pushbutton switches for Emergency Stop and other emergency switches (e.g., Help Me switches) shall be: provided with a red mushroom head; pull to reset; provided with N/C (failsafe) contacts; and shall be non-illuminated.
7. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

O. Indicator Lights (407800.L20).

1. Indicator lights shall be provided as shown on the drawings.
2. Indicator lights shall be of round construction.
3. Indicator lights shall have a built in push-to-test function.
4. Indicator light operation shall be as shown on the Drawings.
5. Indicator light lens colors shall be as shown on the Drawings.
6. Indicator lights shall be provided with high visibility LED lamps with transformers for circuit voltages over 24 VAC/DC, and high visibility LED lamps without transformers for circuits 24 VAC/DC and below.
7. Indicator light contacts shall be rated at 10 Amps.
8. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

P. Speed Setpoint Potentiometer (407800.P20).

1. Speed potentiometers shall be provided as shown on the Drawings.
2. Speed potentiometers shall be of round construction.
3. Speed potentiometers operation shall be as shown on the Drawings.
4. Speed potentiometers shall be 10k-ohm.
5. Provide Allen-Bradley 800H-UR29, or approved equal.

Q. Terminal Strip Identification Block (407800.T15).

1. Provide a terminal strip identification block with a machine generated label to match those shown on the Drawings.
2. Provide a Phoenix Contact marker carrier model number UBE/D, or approved equal.

R. Low Current Terminal Blocks (407800.T10).

1. Low current terminal blocks shall be provided as shown on the Drawings and in all panels requiring low current field terminations. Provide accessories as required and as shown including, but not limited to end anchors, end barriers, bridge jumpers, terminal strip pre-printed markers and snap-in pre-printed terminal block markers.
2. Low current terminal blocks shall be used for electrical circuits rated at or less than 30 amps.
3. Low current terminal blocks shall mount on DIN rail.
4. Low current terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.
5. Low current terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.
6. Low current terminal blocks shall be grey in color.
7. Low current terminal blocks shall be UL rated for up to 30 amps at 600 VAC.
8. Low current terminal blocks shall accept wires from 24 to 10 AWG for single conductor per termination.
9. Provide Phoenix Contact model UK5N, or approved equal.

S. Grounding Terminal Blocks (407800.T60).

1. Grounding terminal blocks shall be provided as shown on the Drawings and in all panels requiring field terminations.
2. Grounding terminal blocks shall be used for electrical circuits rated at or less than 30 amps.
3. Grounding terminal blocks shall mount on DIN rail.
4. Grounding terminal blocks shall be UL rated for a maximum of 30 amps and 600 VAC and to accept wires from 26 to 10 AWG for single conductor per termination.

5. Grounding terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.

6. Low current terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.

7. Grounding terminal blocks shall be green / yellow in color.

8. Provide Phoenix Contact model USLKG5, or approved equal.

T. Fusible DC Terminal Blocks (407800.T30).

1. Fusible DC terminal blocks shall be provided for 24 VDC control circuits as shown on the Drawings.

2. Fusible DC terminal blocks shall be rated for use in electrical control circuits rated 6.3 amps or less and 15-30 VAC/DC.

3. Fusible DC terminal blocks shall mount on DIN rail.

4. Fusible DC terminal blocks shall accept 5 mm by 20, 25 or 30 mm fuses and use LED type blown fuse indicators.

5. Fusible DC terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.

6. Fusible DC terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.

7. Fusible DC terminal blocks shall be black in color.

8. Provide Phoenix Contact model UK5 HESILED 24, or approved equal.

U. Fusible AC Terminal Blocks (407800.T35).

1. Fusible AC terminal blocks shall be provided for 120 VAC control circuits as shown on the Drawings.

2. Fusible AC terminal blocks shall be rated for use in electrical control circuits rated 6.3 amps or less and 110-250 VAC/DC.

3. Fusible AC terminal blocks shall mount on DIN rail.

4. Fusible terminal blocks shall accept 5 mm by 20, 25 or 30 mm fuses and use neon blown fuse indicators.

5. Fusible AC terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.

6. Fusible AC terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.

7. Fusible AC terminal blocks shall be black in color.

8. Provide Phoenix Contact model UK5 HESILA 250, or approved equal.

V. Wire Identification Labels (407800.L02).

1. Wire identification labels shall be provided for all conductors within control panels and control centers.

2. Wire identification labels shall be machine printed, non-adhesive, wire marker heat shrink sleeves with identification numbers that match the approved submittals.

3. Wire identification labels shall be properly sized for the conductor or cable and shall be white with black characters.

4. Provide Brady, Panduit, or approved equal.

W. Power Supply (407800.P02).

1. Power Supplies shall be provided as shown on the Drawings.

2. Power supplies shall operate on 85 to 264V AC / 45 to 65 Hz.

3. Power supplies shall withstand 300V AC short term voltage input.

4. Power supplies shall be rated for 500,000 hours MTBF, minimum.

5. Power supplies shall be rated for less than 15A inrush surge current.

6. Power supplies shall include an internal slow-blow fuse.

7. Power supplies shall include integrated varistors-based transient surge protection.

8. Power supplies shall be adjustable from 22.5 to 29.5V DC output.

9. Power supplies shall be rated for 5A DC output between -25 and 55 degrees Celsius.

10. Power supplies shall be capable of being connected in parallel for increased capacity.

11. Power supplies shall be current limited to 10A short circuit.

12. Power supplies shall be rated for less than 40mV phase to phase residual ripple.

13. Power supplies shall be rated for 3W power loss when idling.

14. Power supplies shall be rated for 14W power loss under nominal maximum load.

15. Power supplies shall include an LED to indicate DC power active.

16. Power supplies shall include a relay contact to indicate DC power active.

17. Power supplies shall be rated at 90% efficient, minimum.

18. Power supplies shall be designed for DIN rail mounting.

19. Power supplies shall be UL508 listed.

20. Provide Phoenix Contact model 2866750 QUINT-PS1/AC24/DC5, or approved equal.

X. Transient Voltage Surge Suppressors (407800.V10).

1. Transient voltage surge suppressors shall be provided as shown on the Drawings.

2. Transient voltage surge suppressors shall be capable of continuously sustaining a minimum of 20 amp for connected loads, operating from 120 VAC power with a line frequency between 47-63 Hz.

3. Transient voltage surge suppressors shall have a UL 1449 Suppressor Classification of 400 VAC for normal/common mode noise suppression.

4. Transient voltage surge suppressors shall include L-N, L-L, L-G and N-G modes of suppression, with noise attenuation of 50dB minimum for normal mode and 40dB minimum for common mode and a peak surge capability of 25kA.

5. Transient voltage surge suppressors shall have a green status LED as well as form C contacts for operating status indication and alarming.

6. Transient voltage surge suppressors shall mount on DIN rail.

7. Provide Sola model STV25K-10S, or approved equal.

Y. Narrow Slot Wire Ducts (Narrow Slot) (407800.W21).

1. Wire ducts shall be provided as shown on the Drawings.

2. Wire ducts shall be large enough to provide a wire fill area no more than 40 percent of the total cross sectional area of the wire ducts.

3. Wire ducts shall be attached to the back panel with screws or plastic fasteners that are approved for use with, and provided by the wire duct manufacturer.

4. Wire ducts shall not be attached to back panel or enclosure side surfaces with glue, tape, or other such adhesives.

5. Wire ducts shall be white in color.

6. Wire ducts shall have slotted sides.

7. Wire ducts shall be provided with removable covers.

8. Provide Panduit Type F, Thomas & Betts Type NPW, or approved equal.

Z. Noise Shield (407800.N20).

1. Noise shields shall be provided as shown on the Drawings.

2. Noise shields shall be designed to provide up to 20 dB reduction in noise, equivalent to six-inch air spacing.

3. Noise shields shall be provided with bonding clips to allow mounting inside wire ducts.

4. Noise shield height shall match the wire duct height.

5. Noise shields shall be perforated and pre-scored.

6. Noise shields shall include vertical wall slots and horizontal cable tie slots.

7. Noise shields shall be zinc plated on all horizontal (contact) surfaces and black powder coated on all vertical surfaces.

8. Noise shields shall be attached to the backpanel with screws or plastic fasteners that are approved for the use and provided by the wire duct manufacturer.

9. Provide Panduit model SD(_)EMI, or approved equal.

AA. Spiral Wrap (407800.W30).

1. Spiral wrap shall be provided as shown on the Drawings and for all conductor and cable wire assemblies that cross hinged connections.
2. Spiral wrap shall be sized per the manufacturer's instructions.
3. Spiral wrapped assemblies shall include a strain relieving loop at each hinge crossing, with a minimum 6 inch vertical height, to minimize flexing of the wires in the conductor and cable assemblies.
4. Provide Panduit, Thomas & Betts, or approved equal.

BB. Cable Ties (407800.W40).

1. Cable Ties shall be provided as required for organizing and arranging conductors within boxes, control panels, and control centers.
2. Cable ties shall be UV resistant.
3. Cable ties shall be black in color.
4. Cable ties shall be installed using a tool from the cable tie manufacturer and specifically intended for use with the cable ties provided.
5. Provide Panduit, Thomas & Betts, or approved equal.

CC. DIN Mounting Rail (407800.D10).

1. DIN Mounting Rail shall be provided as shown on the Drawings and in all panels requiring DIN mounting rail.
2. DIN mounting rails shall be made of steel, galvanized, and yellow chromated.
3. Provide Phoenix Contact model NS 35/7.5, Allen-Bradley model 199-DR1, or approved equal.

DD. Ground Bars (407800.G06).

1. Ground bars shall be provided as shown on the Drawings.
2. Ground bars shall be low profile, "bus" type with set screw or pressure type connections and all copper construction.
3. Ground bars shall include sufficient termination points to accommodate all equipment grounding conductors as shown on the Drawings.
4. Ground bars shall include spare termination points to accommodate twenty (20) additional conductors sized, #14 through #8 AWG.
5. Provide Cutler-Hammer model GBK21, GE model TGK42, Square D model PK27GTA, or approved equal.

EE. Heavy Duty End Bracket (407800.A61).

1. Provide heavy duty end brackets on DIN rails as indicated on the Drawings.
2. Heavy duty end brackets shall be suitable for 35 mm DIN rails.
3. End brackets shall be screw-on style.
4. Provide Phoenix E/AL-NS 35 series or approved equal.

FF. Category 6 Ethernet Patch Cable (407800.C90).

1. Category 6 Ethernet patch cable shall be provided for all Ethernet/IP networked devices.
2. Category 6 Ethernet patch cable shall be suitable for use as Industrial Ethernet Cable, 100BaseTX.
3. Category 6 Ethernet patch cable shall be rated for use in a temperature range between -10 degrees C and 60 degrees C.
4. Category 6 Ethernet patch cable shall be rated for outdoor use.
5. Category 6 Ethernet patch cable shall be rated for 300 volts maximum.
6. Category 6 Ethernet patch cable conductors shall be 4-pair, solid copper, 24 AWG.
7. Category Ethernet patch cable conductor pairs shall be bonded.
8. Category 6 Ethernet patch cable insulation material shall be Polyolefin.
9. Category 6 Ethernet patch cable insulation color shall be blue.
10. Category 6 Ethernet patch cable shall be provided with aluminum foil polyester tape shield with 100% insulation coverage.
11. Category 6 Ethernet patch cable outer jacket material shall be PVC. Jacket material shall be sunlight and oil resistant. Jacket shall have sequential markings at two foot intervals.
12. Category 6 Ethernet patch cable shall be provided with RJ45 plugs, suitable for IP20 applications.
13. Category Ethernet patch cable shall be Belden Data Tuff Industrial Ethernet Cord Set E505 Series, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLERS

A. All identification labeling shall be in compliance with Section 46 76 27 and all other project specifications.

B. CONTRACTOR shall install and connect junction boxes and control panels and to field devices as shown on the Drawings.

C. For all conductors terminating on terminal strips, install crimp-on, insulated plastic sleeve ferrules on each wire. Install ferrules with a crimping tool provided by the ferrule manufacturer for that purpose.

D. Individual conductors and cables shall be grouped together and routed through plastic wire ducts mounted on the backpanel surface.

E. Bond each enclosure back-panel to the grounding electrode system with a # 8 AWG copper conductor.

F. Where conductors and cables are routed in boxes or enclosures, they shall be neatly bundled with cable ties at intervals not to exceed 12 inches on center. The tension for the cable ties shall be set with a tool specifically made for this purpose and of the same

manufacturer as the cable tie. Side cutters or other type tools shall not be used to cut the tail end of the cable tie. The CONTRACTOR shall only use the tool specifically made for this purpose and designed for use with the cable ties provided.

3.02 SOURCE QUALITY CONTROL

A. Tests and Inspections

1. All equipment shall be tested prior to site delivery. All equipment shall be field tested prior to commissioning. CONTRACTOR shall notify the ENGINEER 14 days prior to commencement of field testing.

2. CONTRACTOR-developed test forms shall accompany the notification of testing.

a. Test forms shall list all field connections at terminal strips and all internal logic circuits, along with the method planned for simulation of field conditions to test these connections and circuits.

3. All analog instrument loops shall be tested using an analog signal generator by applying the appropriate control signal to the field termination terminal strip.

a. At a minimum, analog instrument tests shall be made at 0%, 25%, 50%, 75%, and 100% of maximum control signal.

b. Additional analog instrument tests shall be made as appropriate.

4. All digital control circuits shall be tested by: applying the appropriate control voltage to the field termination terminal strip when externally supplied; using a jumper at the field termination terminal strip when internally supplied; or, if applicable, at an internal panel connection point when field terminations are not used.

B. Verification of Performance

1. Device functions shall be observed by the ENGINEER, to determine satisfactory operation of the device and connected circuit continuity, prior to shipment.

3.03 FIELD QUALITY CONTROL

A. Site Tests, Inspection

1. CONTRACTOR shall install, calibrate and test, all systems prior to notifying ENGINEER of witness testing verification.

2. The ENGINEER shall systematically verify the process control system is operating as designed. The CONTRACTOR shall perform the tasks necessary to confirm proper operation to the ENGINEER.

END OF SECTION

SECTION 41 12 13

SHAFTLESS SCREW CONVEYORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Description

1. Shaftless screw conveyors and associated appurtenances for the transport of dewatered biosolids.

B. Equipment Numbers

1. Inclined Conveyor: Tag No. CON-250-03
2. Horizontal Conveyor: Tag No. CON-250-04

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals
2. Section 01 66 00 – Materials and Equipment
3. Section 01 78 23 – Operation and Maintenance Data
4. Section 01 79 00 – Training
5. Section 01 81 00 – Equipment and System Testing
6. Section 01 99 00 – Reference Forms
7. Section 05 50 01 – Anchor Bolts and Anchoring Devices
8. Section 09 96 00 – High Performance Coatings
9. Section 11 05 13 – Electric Motors
10. Section 46 05 13 – General Requirement for Equipment
11. Section 46 05 14– Equipment Mounting
12. Section 46 76 27 – Screw Press Dewatering Equipment

1.03 SUBMITTALS

A. Comply with Section 01 33 00 and submit the following.

B. General arrangement drawings showing the entire assembly. Include a materials list and descriptions of all major components such as all gears and support structure.

C. Descriptive literature and/or catalogs of the equipment, including a detailed equipment specification.

D. A list of at least 20 installations of similar size that have been operating successfully for at least five years in municipal wastewater treatment plants.

E. Spiral strength calculations for spring (spiral) compression and elongation.

F. Conveyor torque calculations stamped by a registered engineer.

G. Torque calculations for the gear reducer and reducer motor.

H. Motor data submittal in accordance with Section 11 05 13.

I. Equipment mounting submittal information specified in Section 46 05 14.

J. Anchor bolt design calculations and details in accordance with Section 05 50 01.

K. Applicable operation and maintenance information specified in Section 01 78 23.

L. Complete and submit the following forms from Section 01 99 00:

1. Motor Data Form.

2. Unit Responsibility Form.

3. Additional forms required during startup per Part 3.

1.04 QUALITY ASSURANCE

A. Unit Responsibility

1. Provide unit responsibility for the equipment included in this section.

B. Coordination

1. Coordinate the shaftless screw conveyor design and installation requirements with the biosolids dewatering equipment manufacturer.

C. Experience

1. A minimum of not less than 10 years experience in the design and manufacture of shaftless screw conveyor systems.

2. At least 20 shaftless screw conveyor systems operating successfully for at least five (5) years at municipal wastewater treatment plants.

1.05 PRODUCT SHIPMENT, PROTECTION, AND STORAGE

A. Comply with Section 01 66 00.

B. Site Storage and Handling of Equipment.

1. Store the supplied equipment in accordance with the manufacturer's recommendations and instruction.

2. Store gear reducers and motors in buildings or trailers which have concrete or wooden floor, a roof and fully enclosed walls, and will protect the equipment from dust, dirt, and moisture.

3. Take responsibility for work, equipment, and materials until inspected, tested and finally accepted.

1.06 PROJECT CONDITIONS

A. Install equipment in an outdoor, canopy covered location at the biosolids dewatering facility, as shown on the Drawings. The majority of the inclined conveyor will not be covered by a canopy and will be continuously exposed to the elements.

1.07 WARRANTY

A. Warranty Against Wear

1. Warrant the liner and spiral against excessive wear for a period of three years following plant start-up.

2. Liner:

a. Excessive wear is indicated by the appearance of the bottom indicator layer (second color) along more than 30 percent of the conveyor length.

b. If excessive wear occurs within the warranty period, provide new formed and banded liner to replace all the liner in the conveyor that has excessive wear.

3. Screw

a. Excessive wear is indicated by loss of more than 50 percent of the height of the main outer screw section over 30 percent of the screw length.

b. If excessive wear occurs within the warranty period, provide new screw to replace the screw in the conveyor that has excessive wear.

4. Complete the Extended Warranty Form in Section 01 99 00. Modify the Extended Warranty Form to apply just for the warranty against wear specified above.

1.08 PERFORMANCE REQUIREMENTS

Performance Requirement	Value
Design Capacity of Inclined Conveyor, cubic feet/hour	100
Design Capacity of Horizontal Conveyor, cubic feet/hour	100
(1) Size the conveyor trough the future condition. Design the motor to meet the design capacity. Provide the capability to replace the motor and reducer to meet the future capacity requirements of the horizontal conveyor.	

1.09 DESIGN REQUIREMENTS

A. Provide shaftless screw conveyor. Screw conveyor with shaft and intermediate hangers are not acceptable.

B. Design motor and gear reducer to be removable without disassembly of conveyor.

C. Design requirements for the inclined conveyor are as follows:

Inclined Conveyor Design Requirement	Value
Material conveyed	Dewatered Digested Sludge
Approx. density of sludge, lbs/ft^3	70
Maximum screw speed, rpm	20
Maximum trough fill rate @ design load, %	45
Approx. length, ft. (centerline of dewatered cake discharge chute to centerline of furthest conveyor discharge chute)	22'-5"(1)
Number of inlets	1
Feed inlet from	Screw Press Discharge Box
No. of discharges	2
Discharge to	Horizontal Conveyor
Discharge through	Discharge Chute
Discharge type	Axial
Location of drive	Pulling
Angle, degrees from horizontal	23
(1) Verify dimensions with drawings.	

D. Design requirements for the horizontal conveyor are as follows:

Inclined Conveyor Design Requirement	Value
Material conveyed	Dewatered Digested Sludge
Approx. density of sludge, lbs/ft^3	70
Maximum screw speed, rpm	20
Maximum trough fill rate @ design load, %	45
Approx. length, ft. (centerline of inlet chute to centerline of discharge chute)	9'-4"
Number of inlets	1
Feed inlet from	Inclined Conveyor Discharge Chute
No. of discharges	1
Discharge to	Dumpster
Discharge through	Discharge Chute
Discharge type	Axial
Location of drive	Pulling
(2) Verify dimensions with drawings.	

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. One of the following:

1. FKC Co. Ltd.

2. Or equal, as defined in Section 01300

2.02 MATERIALS

A. Table 1: Conveyor Component Material Requirements

Component	Material
Chutes, Troughs, End Plates, Covers, Supports	Type 304 stainless steel
Drive Shaft	1045 Steel
Spiral Flighting	Special Chrome-Alloy Steel w/min 225 Brinnell Hardness
Wear Liner	UHMW Polyethylene(1)
Anchor bolts and other fastening hardware	ANSI, Type 304 stainless steel
(1) See Table 2 for specific material properties for the wear liner.	

B. Table 2: Wear Liner Material Properties

Property	Value/Unit	Testing Method
Density	61.2 lbs/ft^3	DIN53479
Molecular Weight	9.2 x 10^6	Margolies
Ball Indentation Hardness	5,946 lbs/in^2	DIN53456
Shore Hardness D	64	DIN53505
Crystalline Melting Range	278^{o}F	
Dynamic Coefficient of Friction	0.1-0.12 ratio of tension/load	Plastic to Steel

2.03 FABRICATION

A. Minimum thickness for steel items

1. Trough lids: 10 gauge.

2. All other components: 10 gauge.

B. Shop welding

1. Comply with Structural Welding code, AWS D1.1, of the American Welding Society.

2. For all welded connections, develop the full strength of the connected elements.

2.04 MECHANICAL COMPONENTS

A. Spiral Flighting

1. Spiral flighting designed to convey material without a center shaft or hanger bearings.

2. Construct spiral flights of cold-formed high strength chrome alloy steel with a minimum hardness of 220 Brinnell. Provide spiral flights with adequate stability to prevent distortion and jumping in the trough.

3. Provide a second, inner spiral, concentric with the outside spiral.

4. Provide the auger flighting with a torsional rating that exceeds the torque rating of the drive motor at 150% of its nameplate horsepower.

5. Limit the "spring effect" of the spiral to 1.0 mm per 100 mm of length at maximum load conditions.

6. Provide a minimum outer spiral thickness of 0.75 inches for spiral diameters up to 9 inches and 1 inch for spirals diameters exceeding 9 inches.

7. Form the spiral flighting in sections from one continuous flat bar that is concentric within a tolerance of 2 mm. Sectional flighting formed from plate is not permitted.

8. Provide full penetration welds at all splice connections.

9. Couple the spiral flights to the end shaft by a flanged, bolted connection.

B. Drive System

1. SEW Eurodrive FAF enhanced screw conveyor drive with four individual sealing areas.

2. Or equal

C. Horizontal and Inclined Troughs

1. Provide U-shaped troughs.

2. Provide inclined conveyor with a 2-inch flanged drain outlet to facilitate cleaning. Pipe the drain outlet to the drain as shown on the drawings. Provide drains with 1-inch flushing connections.

3. Equip the inclined trough with an inlet opening to interconnect with the screw press dewatering unit. Coordinate the opening size with the screw press manufacturer. Flange the openings to provide for a suitable interconnection between the two pieces of equipment.

4. Provide bolted covers on all portions of each trough that is not covered by the filling chutes. Provide covers with a maximum five (5) foot length. To prevent unsafe access to the conveyors, quick opening covers will not be allowed unless they are also bolted to prevent access during operation. Provide each conveyor with the appropriate warning labels to call for lock out – tag out of the electrical system before the covers are removed. Provide one inspection hatch with finger guards on each of the two conveyors.

D. Wear Liner

1. Line the inside trough surfaces of the conveyors with a layer of ultra high molecular weight polyethylene (UHMW-PE). Provide liner by SPIRAC Duraflo SPX, or Xylethon by Durawear, Polystone M or equal.

2. Provide a single piece liner that is formed and bonded with two (2) layers of the same material, each of a different color, to provide a visible indication when the liner is nearing the end of its useful life.

3. Single color liner is acceptable if manufacturer provides ultrasonic thickener tester for testing liner thickness (Yanmis Thickens Gauge, GM100, ½-220 mm digital thickness tester or equal).

4. Provide liner sections that are a maximum length of four (4) feet.

5. Provide stainless steel clips to hold the liner in place. Fasteners are not allowed.

6. Provide a liner with a minimum thickness of 1/2" for spirals up to 14" diameter and a minimum thickness of 5/8" for larger spirals.

7. Proprietary hold-down guide liners mounted under the lids are acceptable as long as they do not interfere with the flow of sludge. Steel hold down bars are prohibited.

E. Conveyor Supports

1. Provide conveyor with supports suitable for mounting conveyors as shown on the drawings.

2. At a minimum, provide the inclined conveyor with supports at the inlet end and at the storage facility wall, with intermediate supports as required.

3. Provide Type 304 stainless steel structural angle supports with a thickness of minimum 0.25".

4. Shop fabricate supports from structural steel shapes and plates. Assemble and fit supports to the conveyor prior to delivery to the jobsite. Match mark supports and conveyor segments for easy Contractor installation.

5. Allow for 1-1/2 inch of grout beneath each support foot pad for the Contractor to compensate for uneven floor elevation.

6. Coordinate with dewatering equipment manufacturer to ensure that the supports avoid interference with other equipment or equipment supports.

F. Drive Units

1. Provide each spiral conveyor with a constant-speed gear reducer motor drive unit. Mount the drive unit to a bellhousing adapter flange that is mounted to the end plate of the conveyor.

2. Design the adapter flange to allow the leakage from inside the conveyor trough to atmosphere rather than into the gear reducer/motor drive unit. Direct coupling of the gear reducer/motor drive unit to the end flange of the conveyor is not acceptable.

3. Design the drive unit to be rigidly supported to prevent any visible vibration.

4. Design the drive system to start the conveyor with the trough filled at two times the design load for loads designed up to 67 percent fill rate, and 1.5 times for loads designed exceeding 67 percent fill rate.

G. Motors

1. Comply with Section 11 05 13, except as modified herein.

2. Type 2, constant speed.

3. Motor Sizes:

   a. Inclined conveyor: maximum 5.0 horsepower

4. Power Requirements: 480 volt, 3-phase, 60 Hertz.

5. Minimum Service Factor: 1.15

6. Nominal Speed: maximum 1,800 rpm

H. Gear Reducers

1. Provide AGMA Class II gears with single or double reduction.

2. Provide helical gear units with high capacity roller bearings. Design bearings with thrust loads for a fully loaded startup condition.

3. Provide bearings with an ABMA L-10 life of 100,000 hours.

4. Design the reducer to be air-cooled with no auxiliary cooling requirement.

5. Size the gear reducer with a torque service factor of 1.5 times the absorbed power or 1.1 times the motor nameplate (at the driven shaft speed), whichever is greater.

I. Chutes and Discharge Boots

1. Furnish inlet and discharge chutes of the same gauge and construction material as the conveyor troughs, at locations as shown on the drawings. Provide minimum 10 gauge thick flanges.

2. Furnish single-ply flanged discharge boots at locations and lengths shown on the drawings. Construct flexible boots of EPDM rubber hose, neoprene, Linatrile by Linatex Corporation, or approved equal.

J. Electrical Equipment

1. Provide electrical equipment that conforms to the applicable standard of the National Electrical Manufactures Association (NEMA) and the National Electrical Code (NEC).

2. Motion Failure Alarm Unit

   a. Provide an external conveyor mounted motion failure alarm, (alternately known as “zero speed” or “under-speed” switch) to detect spiral or drive shaft failure (one for each conveyor). Provide with a NEMA 4 enclosure.

   b. Switch shall interface to the plant control system with 120 VAC rated dry contact or 120 VAC pulse output proximity switch.

3. Emergency Shutdown:

a. Provide an emergency trip cord and safety switch for each conveyor and for the motorized pivot mechanism. Run the cord the full length of each conveyor. Design the trip switch to immediately stop all conveyors and the motorized pivot mechanism when the switch is actuated. The switch shall be RS type by Conveyor Components Corporation or approved equal.

4. Electrical Controls

a. Except as specified above, electrical controls for the shaftless conveying equipment furnished under this section will be provided by others, as part of the control panel(s) for the screw press dewatering equipment being furnished under Section 46 76 27.

2.05 ACCESSORIES

A. Anchor Bolts

1. Comply with Section 05 50 01.

2. Calculations are required.

3. Minimum diameter: 1/2”.

B. Spare Parts

1. One (1) packing gland set, for each conveyor supplied

2. Comply with Section 46 05 13.

C. Lubricants

1. Furnish lubricants of the type and quantity as recommended by the conveyor manufacturer for (start-up) operation.

2.06 FACTORY COATING

A. Furnish gear reducers and motors with the manufacturer’s standard paint system.

B. Stainless Steel

1. Clean with mild abrasive wheels and/or nonferrous blast media to remove heavy scale and welding carbon. It is also acceptable to passivate with stainless steel cleaner and then rinse.

C. Iron and Mild Steel

1. Dry abrasive blast all iron and mild steel in accordance with SSPC-SP6 and Section 09 96 00. Paint surfaces within 24 hours to prevent rusting and surface discoloration.

2. Paint surfaces per Section 09 96 00 (with exception of spiral).

3. Provide spiral with one coat of shop primer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Align, connect, and install equipment in accordance with the manufacturer's written instructions.

B. Ensure true alignment of spiral flights during installation.

C. Trial fit and match-mark mating parts in the factory to ensure field assembly is possible.

D. Provide factory-trained personnel to check installation and test initial operation.

E. Certify installation and initial operation of all components on the appropriate forms included in Section 01 99 00.

3.02 FIELD QUALITY CONTROL

A. Field quality control and inspections will be performed as specified in Section 01 81 00.

B. Corrective Actions: Replace or repair work to eliminate defects, deficiencies and irregularities.

3.03 MANUFACTURER'S FIELD SERVICES

A. Provide field inspection and instruction services by factory-trained service technician of the manufacturer as specified in Sections 01 79 00 and 01 81 00. Services by a sales representative are not acceptable.

1. Provide minimum 1 visit of 8 hours, excluding travel time, to inspect and test initial operation.

2. Provide minimum1 visit of 4 hours, excluding travel time, to train plant operators.

B. Submit completed Manufacturer's Installation Certifications (Section 01 99 00).

C. Submit Manufacturer's Instruction Certification (Section 01 99 00).

3.04 PERFORMANCE TESTING

A. Comply with Section 01 81 00.

B. Torque Testing

1. Operate conveyor under full load to ensure that torque design requirements are met.

3.05 DEMONSTRATION

A. Comply with Section 01 81 00.

END OF SECTION

SECTION 46 05 13

GENERAL REQUIREMENTS FOR EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. General requirements applicable to mechanical equipment and systems.

B. Ensure mechanical equipment meets the requirements of this Section in addition to the specific requirements of the individual equipment specification Sections.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 01 61 11 – Seismic Anchorage and Bracing
3. Section 01 78 23 – Operation and Maintenance Data
4. Section 01 81 00 – Equipment and System Testing
5. Section 01 99 90 – Reference Forms
6. Section 09 96 00 – High Performance Coatings

1.03 GENERAL REQUIREMENTS

A. Equipment shall be of new construction and comply with the following requirements:

1. Designed for stresses that may occur during fabrication, transportation, erection, and during continuous or intermittent operations.
2. Adequately anchored, leveled, aligned, and ready for operation without binding or overloading of critical components or motors.
3. Installed with necessary appurtenances required for proper operation and installation in a neat and workmanlike manner.
4. Tested by factory trained service mechanics or engineers.

1.04 UNIT RESPONSIBILITY

A. Equipment systems shall be assembled as a unit by a single manufacturer responsible for the entire unit.

1. Responsibility extends to selecting components of the system to assure compatibility, proper operation, and compliance with specified performance requirements.
2. Unit responsibility does not relieve Contractor of responsibility to Owner for performance of the Work.

1.05 QUALITY ASSURANCE

A. Arrangement

1. The arrangement of equipment shown on the Drawings is based upon information available at the time of design and is not intended to show exact dimensions peculiar to a specific manufacturer.

2. Some features of the illustrated equipment installation may require revision to meet actual equipment installation requirements.

3. Structural supports, foundations, connected piping, and valves shown may have to be altered to accommodate the equipment provided. Additional payment will not be made for such revisions and alterations.

1.06 SUBMITTALS

A. Comply with Section 01 33 00.

B. General: Provide separate submittals for each equipment item or group of related equipment items.

C. Equipment Anchorage: Submit anchor bolt sizing calculations.

D. Bearing Life Calculations: Submit bearing L-10 life calculations in accordance with ABMA requirements.

1.07 OPERATION AND MAINTENANCE MANUALS

A. Furnish operation and maintenance manuals for each equipment system in accordance with the Section 01 78 23 requirements.

1.08 PROTECTION DURING SHIPMENT

A. Shipping: Ship equipment in sealed, weather-tight, enclosed conveyances, and protected against damaging stresses during transport and handling.

B. Bearing Housings: Wrap or otherwise seal to prevent contamination by grit and dirt, and tape closed ventilation and other types of openings.

C. Repair any damaged materials to conform to the requirements of the Contract before the assembly is incorporated into the Work. The Contractor shall bear the costs arising out of dismantling, inspection, repair, and reassembly.

PART 2 - PRODUCTS

2.01 PIPING CONNECTIONS ON EQUIPMENT

A. Flanges on Equipment: Conform to dimensions and drilling specified in ANSI B16.1, Class 125 unless otherwise required by Division 40 pipe specifications or the Drawings.

B. Pipe Flanges: Conform to dimensions and drilling specified in AWWA C207, Class D, 125 lb flanges provided on connection pipe.

C. Threaded Flanges: Flat faced with standard taper pipe thread conforming to ANSI B1.20.1.

D. Pipe Threads: Conform in dimension and limits of size to ANSI B1.1, coarse thread series, Class 2 fit.

E. Flange Assembly Bolts and Nuts

1. Heavy pattern, hexagonal head, stainless steel machine bolts with heavy pattern, hot pressed, hexagonal nuts conforming to ANSI B18.2.1 and B18.2.2.

2. Threads: Unified Screw Threads, Standard Coarse Thread Series, Class 2A and 2B, ANSI B1.1.

2.02 BEARINGS

A. Service: Unless otherwise specified, equipment bearings shall be oil or grease lubricated, ball or roller type, designed to withstand the stresses of the service specified.

B. Rating

1. L-10 Rating Life: Minimum 50,000 hours unless otherwise specified. Determine rating life using the maximum equipment operating speed.

2. Determine rating in accordance with the latest revisions of AFBMA Methods of Evaluating Load Ratings of Ball and Roller Bearings.

3. Where individual equipment Sections specify higher bearing life ratings, those requirements supersede the minimum bearing life specified above.

C. Grease Lubricated Bearings

1. Fit with easily accessible grease supply, flush, drain and relief fittings, except those bearings specified to be factory sealed and lubricated.

2. Extend non-accessible grease fittings to an easily accessible location using 1/4-inch diameter stainless steel tubing as an extension tube.

3. Grease supply fittings: Standard hydraulic Alemite or Zerk type.

D. Oil Lubricated Bearings

1. Equip with either a pressure lubricating system or a separate oil reservoir type system.

2. Size oil lubrication systems to safely absorb the heat energy normally generated in the bearing under a maximum ambient temperature of 60°C.

3. Equip with a filler pipe and an external level indicator gage.

E. Incorporate bearing housings with sufficient cooling to maintain surface temperature at 65 degrees C or less for continuous operation at bearing rated load and a 50 degrees C ambient temperature, or install appropriate shielding on bearings that are accessible to touch.

2.03 DRIVE COMPONENTS

A. V-Belt Drives

1. Design with sliding base or other suitable tension adjustment.

2. Design with service factor of at least 1.6 at maximum speed.

3. Statically balance sheaves. In addition, dynamically balance sheaves that will operate at peripheral speed of more than 5,500 feet per minute.

4. Belts: Provide anti-static belts when explosion-proof equipment or environment is specified.

B. Gear Reducers

1. Provide drives with nominal input horsepower rating equal to or greater than the nameplate horsepower of the drive motor.

2. Provide gear drives manufactured in accordance with AGMA Class II service requirements.

2.04 SHAFT COUPLINGS

A. Type and Rating: Non-lubricated, designed for a minimum of 50,000 hours operating life.

B. Equipment with a driver greater than 1/2 horsepower, and where the input shaft of a driven unit is directly connected to the output shaft of the driver, shall have its two shafts connected by a flexible coupling which can accommodate angular misalignment, parallel misalignment and end float, and which cushions shock loads and dampens torsional vibrations.

C. Provide couplings recommended by the coupling manufacturer for the specific application, considering horsepower, speed of rotation, and type of service.

D. Install couplings in conformance to the manufacturer's instructions.

2.05 GUARDS

A. Guards

1. Enclose exposed moving parts with guards that meet the requirements of federal and state OSHA requirements.

B. Materials

1. Fabricate guards of 14 gauge steel and expanded metal screen to provide visual inspection of moving parts without removal of the guard.

2. Galvanize after fabrication and paint with the equipment.

3. Fasteners: Type 304 stainless steel.

2.06 NAMEPLATES AND LIFTING EYES

A. Nameplates

1. Provide on each item of equipment with the specified equipment name or abbreviation and equipment number.

2. Engrave or stamp (not painted) on stainless steel and fastened to the equipment in an accessible location with stainless steel screws or drive pins.

B. Lifting Eyes

1. Provide on equipment weighing over 80 lbs.

2.07 SPARE PARTS AND LUBRICANTS

A. Spare Parts: Provide for each item of mechanical, electrical, and instrumentation equipment a supply of spare parts and special tools required for the starting, testing, adjustments, and initial operation. Pack spare parts required by individual equipment specifications:

1. Pack spare parts with individual weights less than 50 pounds in a heavily constructed painted wood box with hinged cover and a locking clasp.

2. Provide a typed inventory of spare parts stapled to the underside of the cover.

3. Tag and wrap each part in a waterproof container. Spare bearings shall be encapsulated in an airtight plastic film.

B. Lubricants: Provide for each item of mechanical equipment of the type recommended by the equipment manufacturer a supply of the lubricant for startup, testing, and initial operation.

1. Provide a list showing the required lubricants for each item of mechanical equipment. List estimated quantity of lubricant needed for a full year's operation, assuming the equipment will operate continuously.

2. Lubricants shall be products of the Owner's current lubricant supplier.

3. Limit the various types of lubricants by consolidating them, with the equipment manufacturer's approval, into the least number of different types.

2.08 ANCHOR BOLTS

A. Size anchor bolts and concrete anchors for equipment in accordance with Section 01 61 11.

2.09 FACTORY APPLIED COATINGS

A. Ship each item of equipment to the site of the work with a shop applied prime coating prepared in accordance with the requirements of Section 09 96 00 and compatible with the finish coatings.

B. Finish Painting of Motors: Factory-apply finish coats using manufacturer's standard coating, unless otherwise specified in Section 09 96 00.

2.10 SPECIAL TOOLS AND ACCESSORIES

A. Furnish with each piece of equipment all tools, instruments, or accessories of a special nature that are required to assemble, disassemble, maintain, or repair any item of equipment.

1. Tag and mark each piece indicating their service and the piece of equipment for which their use is intended.

2. Include a list and description or pictorial representation of all special tools required for a given piece of equipment for insertion into the equipment operation and maintenance manual.

2.11 FASTENERS AND DIELECTRIC ISOLATION

A. Fasteners for Aluminum: Stainless steel.

B. Isolate steel surfaces, other than stainless steel, from aluminum with stainless steel, neoprene, non-metallic washers or other acceptable material.

C. Dissimilar Metals: Protect from galvanic corrosion by means of pressure tapes, coatings, or isolators.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install, align, and test each item of equipment within the tolerances recommended by the equipment manufacturer.

B. When specified in individual Sections, install and test equipment under the direction of installation engineers who have been factory trained by the equipment manufacturer.

C. Perform all work in accordance with manufacturer's recommendations.

3.02 QUALITY CONTROL

A. Test equipment in accordance with Section 01 81 00 and the individual equipment Section.

B. Furnish written certification from the equipment manufacturers that each item has been installed, aligned, and tested correctly and that the installation meets the manufacturer's requirements for efficient, trouble-free operation. Utilize Manufacturer’s Installation Certification Form provided in Section 01 99 90.

C. Equipment manufacturer’s certification shall not be construed as relieving the Contractor of his overall responsibility for this portion of the work.

END OF SECTION

SECTION 46 05 14

EQUIPMENT MOUNTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Equipment mounting requirements, including fabricated steel equipment bases, concrete equipment pads, supports, anchorage, and accessories.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section

1. Section 01 33 00 – Submittals
2. Section 05 50 01 – Anchor Bolts and Anchoring Devices
3. Section 09 96 00 – High Performance Coatings

1.03 QUALITY ASSURANCE

A. Provide supports, anchorage, and equipment mounts that are sized and designed to resist the calculated forces and that are in accordance with the manufacturer's recommendations, the current International Building Code (IBC), and industry standards requirements.

1.04 DESIGN REQUIREMENTS

A. Design equipment mounts and anchorages to resist the minimum lateral force required by the latest edition of the IBC, the manufacturer of the equipment, or a lateral seismic force of 60% of the operating weight of the equipment, whichever is greater.

B. Equipment anchor bolt sizes shown on the Drawings are the minimum required size.

C. Equipment anchorage design and calculations shall be prepared and signed by a civil or structural engineer currently registered in the state where equipment is installed.

1.05 MOUNTING REQUIREMENTS

A. Mount equipment and driver on a common fabricated steel baseplate with ample rigidity to support equipment and maintain shaft alignment without excessive deflection.

B. Mount equipment baseplates on concrete equipment pads.

1.06 SUBMITTALS

A. Comply with Section 01 33 00.

B. Shop Drawings: Provide drawings of equipment bases and anchorage details.

C. Anchorage Calculations: Submit stamped and signed anchor bolt sizing calculations.

PART 2 - PRODUCTS

2.01 ANCHOR BOLTS AND CONCRETE ANCHORS

A. Provide anchor bolts and concrete anchors in accordance with Section 05 50 01.

2.02 CONCRETE EQUIPMENT PADS

A. Construct concrete pedestals at least 6 inches wider and longer than the steel or cast base so that the distance between the anchor bolts and the edge of concrete is at least 3 inches.

B. Unless otherwise shown or specified, all conduits, piping connections, drains, etc. shall be enclosed by the concrete base.

C. Shape concrete pedestals to drain away from the base.

D. Allow concrete to cure 14 days or until the concrete has cured to 75 percent of its specified compressive strength before placing equipment on the concrete pedestal.

E. Do not start equipment placed on the concrete pedestal until the concrete has cured for 28 days or to 100 percent of its specified compressive strength.

2.03 STRUCTURAL STEEL EQUIPMENT BASES

A. Provide structural steel bases with thickened steel pads for doweling.

1. Fabricate equipment base using continuous welds to seal seams and contact edges between steel members.

2. Grind welds smooth.

B. Design equipment bases with perimeter steel beams, intermediate stiffeners and baseplate.

1. Provide perimeter steel beams with minimum depth equal to 1/10th of the longest dimension of the base.

2. Beam depth need not exceed 14 inches provided that the baseplate deflection is kept within acceptable limits to minimize misalignment, as determined by the manufacturer.

C. Provide grout holes for the bases of equipment where vibration isolation is not specified.

D. Provide minimum 1-inch thick steel mounting baseplate for equipment with drivers 20 horsepower and larger.

E. Shop-apply prime coat prepared in accordance with the requirements of Section 09 96 00 and compatible with the finish coatings

PART 3 - EXECUTION

3.01 GENERAL

A. Connect piping to equipment with flexible connections and/or expansion joints such that the intended use of these joints is maintained in the piping system.

B. Coordinate the location of electrical conduit and piping penetrations within the concrete pad and equipment base.

1. Stub-up penetrations on the same side of the equipment as required for connection to the equipment.

2. Locate equipment drains for proper drainage away from equipment.

3.02 EQUIPMENT MOUNTING

A. Mount equipment on equipment baseplates using stainless steel shims so that equipment and driver are level in both directions and mounted within machined areas on baseplate. Do not use wedges to obtain level and alignment.

B. Utilize templates for placement of anchor bolts prior to placing concrete for equipment pad.

C. Apply a non-seize or non-galling compound on the threads of anchor bolts and concrete anchors.

3.03 SHAFT ALIGNMENT

A. After the complete unit has been installed on the equipment pad and leveled, check the factory shaft alignment by disassembling coupling and measuring angular and parallel orientations.

B. Use reverse-indicator dial or laser type alignment equipment to align shafts to within the manufacturer's required tolerance. Allow for thermal expansion, spacer coupling length and other factors that affect proper shaft alignment.

3.04 GROUTING EQUIPMENT BASED

A. After alignment has been completed, tighten anchor bolts and grout between equipment base and equipment pad. Use non-shrink and non-ferrous grout no less than 7/8 inch and no more than 1-5/8-inches thick.

B. Allow 48 hours for grout to harden and then remove jacking screws. Re-check torque on anchor bolts and re-check shaft alignment, making corrections as necessary.

END OF SECTION

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SECTION 46 33 33

POLYMER BLENDING UNITS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for a polymer blending and feed system to provide prepared polymer solution from a concentrated raw polymer supply.

B. If required to meet the Project schedule, the polymer blending unit manufacturer may propose alternative components for consideration during bidding. The alternative components must be equal in quality and function to the components included in this specification. Alternative components must also be industry standard components and components that are typically used by the manufacturer.

C. Equipment List

Location	Equipment No.
Biosolids Mechanical Dewatering Facility	POL-250-06

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals
2. Section 01 66 00 – Materials and Equipment
3. Section 01 78 23 – Operation and Maintenance Data
4. Section 01 81 00 – Equipment Startup and Testing
5. Section 01 99 00 – Reference Forms
6. Section 05 50 01 – Anchor Bolts and Anchoring Devices
7. Section 09 96 00 – High Performance Coatings
8. Section 11 05 13 – Electric Motors
9. Section 46 05 13 – General Requirements for Equipment
10. Section 46 05 14 – Equipment Mounting
11. Section 46 76 27 – Screw Press Dewatering Equipment

1.03 COORDINATION

A. Provide POL-250-06 to the dewatering equipment manufacturer for inclusion in the biosolids mechanical dewatering polymer system.

B. Verify requirements for POL-250-06 with the dewatering equipment manufacturer.

1.04 DESIGN REQUIREMENTS

A. Criteria

1. Provide an integrated equipment package designed to automatically meter, activate, dilute with water, and feed high molecular weight liquid polymer.
2. Include: Mounting skid, neat polymer metering pump, mixing chamber, booster pump (if required by this specification), piping and fittings, integral control panel, connections to automatic controls, and all necessary appurtenances required for proper and efficient operation.
3. Design unit to discriminately apply high mixing energy to maximize polymer activation while preventing polymer jelling, agglomeration or damage to its molecular structure.
4. Design mixing chamber to maximize the dilution and dynamic activation of liquid polymer. Not acceptable: conventional static mixers or mixing blocks for primary polymer dilution or activation.
5. Do not expose polymer to a centrifugal pump impeller or other cause of excessive shear.
6. Provide progressing cavity polymer metering pump to convey concentrated polymer to mixing chamber.
7. Design all components which require periodic maintenance to be readily accessible.
8. Design unit for working pressure of 100 psi, except as noted below.
9. Electrical Equipment
    a. Comply with standards or requirements of National Electrical Manufacturer Association (NEMA) and National Electrical Code (NEC).
    b. Insulate both power and control equipment for 600V even though operating voltage may be lower.
10. Mount all components securely on a single Type 304 stainless steel frame.
11. Plant Water Supply
    a. Water for cleaning sprays and polymer blending will be plant effluent (UW) filtered through a tertiary disk filter with nominal 10-micron opening and that may contain small quantities of biological floc and dilute concentrations of industrial solvents.
    b. If additional filtration is required, provide a strainer at the water connection point.
12. The water pressure as it enters the dewatering building is expected to range from 60 to 80 lbs/in^2.
13. If additional pressure is required, provide a booster pump system to meet the pressure needs of the screw press system.

B. Performance

1. Conform to the following:

Equipment No.	POL-250-06
Dilution water capacity, gph	60 - 600
Polymer viscosity, centipoise	< 5,000
Diluted polymer concentration, percent	0.3 – 0.7
Downstream dilution required	No
Polymer feed pump	
Discharge capacity, required range, gph	0.25 – 5.0
Maximum discharge pressure, psig	65
Functional turndown range, minimum	20:1

1.05 SUBMITTALS

A. Comply with Section 01 33 00.

B. Include a copy of the contract document control diagrams and process and instrumentation diagrams, with addenda updates, that apply to the equipment in this section.

1. Mark to show specific changes necessary for the equipment proposed in the submittal.

2. If no changes are required, mark the drawing or drawings “No Changes Required”.

3. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

C. Include the following items:

1. Complete equipment list, identifying all electrically powered equipment including pumps, powered valves, and motors, process control instruments, equipment safety instruments and switches, and motor starters.

2. Wiring and connection diagrams indicating all electrical connections.

3. Motor submittal information as specified in Section 11 05 13.

4. Equipment mounting submittal information specified in Section 46 05 14.

a. Applicable operating and maintenance information specified in Section 01 78 23.

b. Complete and submit the following forms from Section 01 99 00.

1) Motor Data Form.

2) Unit Responsibility Form.

3) Additional forms required during startup per PART 3.

1.06 QUALITY ASSURANCE

A. Unit Responsibility

1. Assign unit responsibility as specified in Section 46 05 13 to the screw press dewatering equipment manufacturer for the equipment specified in this section.

1.07 SHIPMENT, PROTECTION AND STORAGE

A. Comply with Section 01 66 00.

1.08 ENVIRONMENTAL CONDITIONS

A. The equipment will be installed in a weather-exposed outdoor location covered by a canopy.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Dyna Blend as manufactured by Fluid Dynamics, Inc.

B. Polyblend as manufactured by UGSI ChemFeed.

C. VeloDyne as manufactured by Velocity Dynamics.

D. Or equal as specified in Section 01 33 00.

E. Modify equipment as required to meet the requirements of this section.

F. Coordinate with dewatering equipment manufacturer.

2.02 MATERIALS

A. Mounting Frame: Type 304 stainless steel

B. Mixing Chamber: Type 304 stainless steel or PVC/acrylic

C. Fasteners: Type 304 stainless steel.

D. Control Panel: Type 304 stainless steel.

2.03 PIPING CONNECTIONS

A. Dilution water inlet, 1.0” FNPT

B. Neat polymer inlet, 1” NPT

C. Polymer solution discharge, 1.0” FNPT

2.04 EQUIPMENT COMPONENTS

A. Hydrodynamic Mixing Chamber – Fluid Dynamics

1. Produce high fluid shear conditions without use of internal mechanical mixing systems. Employ hydrodynamic action to combine the polymer and dilution water.

2. Stage mixing energy to provide for high, non-damaging mixing energy over the full operating range of the system which then dissipates through concentric chambers.

3. Provide an integral, multi-stage, stainless steel dilution water booster pump with pressure regulating valve capable of producing a minimum 50 psi differential pressure across the water control orifice. Systems that rely on dilution water

distribution system pressure and flow alone to create mixing energy shall not be acceptable.

4. Provide an integral water control device to also produce mixing energy by creating a pressure drop across its orifice. Configure to allow orifice replacement without disassembly of any other part of the system.

5. Provide drain valve with 1/2" fitting.

B. Motorized Mixing Chamber – UGSI ChemFeed

1. Mix polymer and water in a chamber designed to create sufficient mixing energy.

   a. Provide a motor-driven impeller that will create high fluid shear for mixing polymer and water.

   b. Taper mixing intensity as solution exits the initial shear zone and passes through a second zone, isolated by a baffle.

   c. Design so polymer activation efficiency is consistent over the dilution water range.

2. Motor

   a. Comply with Section 11 05 13.

   b. Size: 1 HP maximum.

   c. Constant speed, washdown duty motor.

   d. Nominal Maximum speed: 3,450 rpm.

   e. Direct-coupled to impeller shaft.

C. Hydro-Mechanical Mixing Chamber – Velodyne

1. Mixing Chamber

   a. Capable of operating on source water pressure alone at 30 psi differential pressure, or independently of plant water pressure through a motor-driven stainless steel mechanical mixer. Design mixing impeller to produce both axial and radial flow and to induce high, non-damaging mixing energy over the full flow range.

   b. Mixer drive shaft: sealed by a mechanical seal with an integrally mounted and factory plumbed seal flushing valve. Provide a drain port in the mixing chamber to drain polymer solution in case of seal failure. The seal shall be easily accessible for replacement.

   c. Bearings: external to the mixing chamber.

2. Motor

   a. Comply with Section 11 05 13.

   b. Wash-down duty

   c. Speed: Variable. Provide SCR motor controller.

   d. Size: 1 HP maximum

   e. Nominal maximum speed: 1,750 rpm

   f. Direct-coupled to impeller shaft

   g. Provide mechanical shaft seal flushing gland

D. Mixing Chamber Pressure Relief Valve

1. Range: 25 to 65 psi.
2. Stainless steel body with stainless steel, Viton and Teflon internals.

E. Neat polymer check valve

1. Design to isolate neat polymer from dilution water.
2. Design with an open, unobstructed path to the valve seat.
3. Valve body: Teflon or stainless steel.
4. Seals: Viton
5. Ball and spring: Stainless steel.
6. Make valve readily accessible for cleaning and easily disassembled.
7. Check valves that are installed inside the mixing chamber, or which require mixing chamber disassembly for servicing are not acceptable.

F. Pressure gauges:

1. Use to monitor the dilution water inlet and diluted polymer solution pressures.
2. Liquid filled and of stainless steel construction.
3. Size: 2-1/2" face
4. Range:
    a. Dilution Water: 0-100 psig
    b. Diluted Polymer Solution: 0-60 psig

G. Dilution Water Control

1. Flow measurement: Rotameter-type flow meter or electronic flow sensor
    a. Range: 0-10 gpm.
    b. Provide unions on the inlet and outlet to allow easy removal for cleaning.
    c. Metering tube: Cast acrylic
    d. Internal components: Type 316 stainless steel
    e. Fittings: PVC
2. Flow control: Provide flow control valve
3. Pressure reducing valve:
    a. Provide stainless steel body PRV in dilution water line
    b. Minimum output pressure range: 25 - 75 psig.
4. Loss-of-flow indication: Differential pressure switch.
    a. Set to sense loss of dilution water flow.
    b. Static working pressure: minimum 150 psi
    c. Rating: NEMA 4X.
    d. On loss of dilution water flow, place metering pump on standby; restart automatically when flow is restored.

5. Provide electric solenoid valve for on/off control of total dilution water flow:
    a. Body: Stainless steel or brass
    b. Rating: NEMA 4X.
    c. Power: 120VAC
    d. ASCO RedHat 8210G or equal.

H. Neat Polymer Metering Pump

1. Pump
    a. Type: Positive displacement, progressing cavity, with 316 SS rotor and Viton stator.
    b. Priming: Do not require the pump to be modified for priming.
    c. Mount directly on skid.
    d. Pump output control: Provide local manual control using a potentiometer, and automatic control in response to a 4-20 mA flow signal.
    e. Power: 120 VAC.
    f. Provide loss-of-flow sensor. On low flow/loss of flow, shut down system and provide local and remote indication of alarm. Pressure switches or mechanical or reed type switches are not acceptable.
    g. Provide a hand vacuum pump for priming.
2. Motor
    a. Washdown duty.
    b. Direct-couple motor and pump to a gear reducer.
    c. Provide one of the following:
        1) 1/2 HP, 0-90 volt TENV DC motor with variable speed provided by an SCR controller
        2) Type 2 motor per Section 11 05 13, with VFD

I. Skid

1. Construct of 3/16" minimum Type 304 stainless steel angle or structural stainless steel tubing.
2. Do not use mild steel.
3. Sheet metal supporting the control panel: Minimum thickness of 12 gauge.
4. Gusset vertical frame members.
5. Pipe Supports: Stainless steel.
6. Design for forklift.
7. Drill for anchor bolt mounting to concrete pad.
8. Maximum Dimensions
    a. Overall: 48” wide x 36” deep x 70” high.
    b. Mount control panel in vertical position at 60” above pad.

9. Polymer pump suction: do not exceed 18” above pad.

10. Mount piping and valves with rigid pipe clamps. Fasteners required to mount components: Minimum 1/4-20 stainless steel.

2.05 PROCESS CONTROLS AND INSTRUMENTATION:

A. Require manufacturer to design all electrical components including motor starters, switches, instrument devices, conduit, cable and other miscellaneous components.

B. Control Panel

1. Provide relays, digital displays, switches and status lights for all operating units to indicate control of electrical equipment.

2. Enclosure: NEMA 4X, fiberglass

3. Equip with a main disconnect switch, lockable in the OFF position and provide with a door interlock feature which prevents the panel front door from being opened unless the disconnect switch is in the OFF position.

4. Operating Mode: Determined by the position of a LOCAL/OFF/REMOTE switch mounted on the control panel.

5. Provide contacts for confirmation of polymer feed pump’s running status.

6. Provide local control:

a. Panel mounted ten-turn potentiometer knob or membrane keypad with increase/decrease push button, for controlling the neat polymer metering pump in LOCAL mode with digital display of polymer pump speed on panel.

b. Internal potentiometer, for controlling the mixing chamber speed.

7. Provide cable, conduit, conductors, and other electrical hardware per electrical specifications.

8. Switches and indicator lights: Allen Bradley series 800F or 800H, NEMA 4X. "Mini" LED indicator lights, toggle switches and residential light switches are not acceptable as control devices or indicators.

9. Provide terminal blocks for all skid mounted electrical components interconnected to control panel. Size for 14 ga. wires with and include terminal block numbers and legend, as manufactured by Entrelec or equal.

10. Use wire raceway and number wires with adhesive labels.

11. Control Devices

a. Fused type door mounted disconnect (required for 480 VAC or greater).

b. LOCAL - OFF - REMOTE switch with contacts to receive remote start/stop signal (dry contact) in “Remote” mode. Unit is manually powered in the “Local” mode.

c. HAND-OFF-AUTO switch for operating mode selection. In AUTO mode, control pump speed via 4-20 mA input signal.

d. Alarm reset Push-Button.

12. Indicators

    a. LCD display of polymer pump speed.

    b. Power ON indicator.

    c. Low differential pressure or loss of water alarm.

    d. Loss of polymer

13. Alarms

    a. Provide Loss of Polymer Flow Alarm, thermal sensor type. Place system on standby when loss of polymer flow occurs, and require manual restart. Provide 0 to 60 second time delay relay to prevent nuisance alarms from occurring.

    b. Provide Loss of Water Alarm, differential pressure type. Place system on standby on loss of dilution water, and restart automatically when flow is restored.

14. Inputs (signals by others):

    a. Accept 4-20 mA analog input signal to provide automatic polymer pump pacing in “Auto” mode.

    b. Accept a run/stop signal (discrete dry contacts) to turn pump on/off in “Remote” mode.

15. Outputs

    a. 4-20 mA output proportional to pump speed.

    b. System "Running" status output, dry contact.

    c. System in "Remote mode" status output, dry contact.

2.06 ACCESSORIES

A. Anchor Bolts

1. Comply with Section 05 50 01.

2. Calculations are required.

3. Minimum diameter: 1/2”

B. Polymer Tote Mixers

1. Provide two (2) adjustable bracket-mounted vertical tote mixers:

    a. Size for IBC 330-gallon totes.

    b. Motor: 1/2-horsepower, 115/230 VAC.

    c. Provide 3/4-inch 316 stainless steel shaft.

    d. 316 stainless steel propeller shall fold to fit through 2-inch tote opening, and open to 9-inch operating diameter.

    e. Provide a second folding propeller for mounting along 3/4-inch shaft.

    f. Include adjustable aluminum mounting brackets. Contractor to coordinate with Owner and mixer supplier to ensure appropriate mounting bracket for IBC tote style in use by Owner.

g. Include standard 3-prong power cord of sufficient length for the installation as depicted in the Drawings.

h. Manufacturer:

1) Neptune Chemical Pump Co., Inc. Model RGT 1.0, with RGT-BKT mounting bracket.

2) Or equal.

C. Polymer Tote Heating Blankets

1. Provide two (2) adjustable tote heating blankets:

a. Size for IBC 330-gallon caged, plastic or metal totes.

b. Voltage: 120 VAC

c. Wattage: 1440 W

d. Provide two heat zones each with an adjustable thermostat: 50-160 degrees Fahrenheit.

e. Provide built-in manual reset high-limit safety thermostat for each heat zone set at 195 degrees Fahrenheit.

f. Attachment method: adjustable nylon straps with plastic or non-ferrous metal buckles.

g. Provide silicone impregnated cloth facing and liner.

h. Insulation: 1/4-inch fiberglass

i. Include opening for tote spigot.

j. Include separate insulated top cover. Top cover shall be removable from remainder of heating blanket to accommodate installation and removal of tote mixers.

k. Include standard 3-prong power cord of sufficient length for the installation as depicted in the Drawings.

l. Manufacturer:

1) BriskHeat.

2) Or equal.

D. Spare Parts

1. Provide 1 set manufacturer's recommended spare parts, including but not limited to the following:

a. Solenoid valve.

b. Neat polymer metering pump mechanical seal and pump stator.

c. Mixing chamber o-rings.

d. Neat polymer check valve.

E. Comply with Section 46 05 13.

2.07 FABRICATION

A. Factory assemble each pump, drive, and motor to its common base.

B. Factory finish any non-stainless steel components. Comply with Section 09 96 00.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Align, connect, and install each unit as shown and in accordance with the manufacturer's written instructions.

B. Provide factory-trained personnel to check installation and test initial operation.

C. Certify installation and initial operation of all components using the appropriate forms included in Section 01 99 00.

3.02 FIELD QUALITY CONTROL

A. Field quality control and inspections will be performed as specified in Section 46 76 27 and Section 01 81 00.

B. Corrective Actions: Replace or repair work to eliminate defects, deficiencies and irregularities.

3.03 PERFORMANCE TESTING

A. General:

1. Following installation, field test polymer system per Section 46 76 27 and Section 01 81 00 to demonstrate compliance with performance requirements as specified.

2. Schedule testing 30 days in advance with the Construction Manager.

3. Include operation of new equipment with new control system.

4. Contractor: responsible for all labor, chemical, water, power and other costs associated with polymer system testing.

5. Empty and dry polymer system equipment and piping following successful testing and commissioning of associated control loops, and prior to pumping chemicals.

B. Water Tests:

1. Subject polymer system to a field test using water.

2. Test for two hours to demonstrate the mechanical and electrical integrity of the system.

3. Inability to successfully complete clean water tests in three tries because of problems directly caused by the polymer system will be considered cause for the Construction Manager to reject the equipment.

C. Polymer Test:

1. Repeat clean water test using polymer.

3.04 MANUFACTURER'S FIELD SERVICES

A. Provide field inspection and instruction services by factory-trained technician or factor trained authorized agent of the manufacturer as specified in Section 46 76 27 and Section 01 81 00.

1. Provide minimum 1 visit of 8 hours, excluding travel time, to inspect and test initial operation, and make necessary adjustments.

2. Provide minimum 1 visit of 8 hours, excluding travel time, to train plant operators to operate and maintain of equipment items included in this Section.

B. Complete and submit the following forms in Section 01 99 00:

1. Manufacturers Installation Certification.

2. Manufacturers Instruction Certification.

3.05 DEMONSTRATION

A. Comply with Section 46 76 27 and Section 01 81 00.

END OF SECTION

SECTION 46 76 27

SCREW PRESS DEWATERING EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for furnishing installing a complete screw press dewatering system and all appurtenances specified, or otherwise required, for a complete and properly operating system. The system will be temporarily used to treat waste activated sludge from a sludge blend tank. The system will then be used to treat digested sludge from anaerobic digester.

B. If required to meet the Project schedule, the screw press dewatering system manufacturer may propose alternative components for consideration during bidding. The alternative components must be equal in quality and function to the components included in this specification. Alternative components must also be industry standard components and components that are typically used by the manufacturer.

C. Equipment Numbers

1. Screw Press: Tag No. DEW-250-02
2. Flocculation Tank: Tag No. MIX-250-01
3. Polymer Blending Unit: Tag No. POL-250-04
4. Control Panel: Tag No. LCS-250-01

D. Scope of supply:

1. One (1) screw press dewatering unit, including supports
2. One (1) flocculation tank including mixer
3. One (1) polymer blending and injection system for liquid polymer, including a polymer blending unit.
4. One (1) control panel
5. Mounting equipment, anchor bolts, concrete anchors, and other anchoring devices
6. Spare parts
7. All other accessories and appurtenances required to provide a complete and fully functional screw press dewatering system for Owner's use, whether or not specifically indicated in this Section.
8. Screw press, flocculation tank, polymer blending unit, control panel, and all other accessories and appurtenances will be integrally mounted as components of a dewatering skid, each component prewired and pre-piped to each other on the dewatering skid from the factory.
9. Two shaftless screw conveyors (one inclined conveyor and one horizontal conveyor) will not be integrally mounted to the skid and are to be provided loose and separate from the skid. See Section 41 12 13 for conveyor specifications.

Dewatering skid will have a junction box near the screw press discharge end for all power and signal wiring requirements of the conveyor.

E. Intent of Drawings

1. Drawings show only general locations of equipment, devices, and supports.

2. The Drawings are based on equipment that is manufactured by the first manufacturer named in Paragraph 2.01 of this Specification Section. This first named manufacturer is also listed in the bid form "Major Equipment of System Schedule Supplied by the Construction Contract". The Contractor shall be responsible for the design and construction of any modifications that are necessary to install dewatering equipment provided by another manufacturer. All modifications to the design are subject to approval by the Engineer.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals
2. Section 01 61 10 – Seismic Design Requirements
3. Section 01 66 00 – Material and Equipment
4. Section 01 78 23 – Operations and Maintenance Data
5. Section 01 79 00 – Training
6. Section 01 81 00 – Equipment Startup and Testing
7. Section 01 99 00 – Reference Forms
8. Section 05 50 01 – Anchor Bolts and Anchoring Devices
9. Section 09 96 00 – High Performance Coatings
10. Section 11 05 13 – Electric Motors
11. Section 40 78 00 – Panel Mounted Equipment
12. Section 41 12 13 – Shaftless Screw Conveyor
13. Section 46 05 13 – General Requirements for Equipment
14. Section 46 05 14 – Equipment Mounting
15. Section 46 33 33 – Polymer Blending Units

1.03 REFERENCED STANDARDS

A. This section contains references to the following documents. They are part of this section as specified and modified. In case of conflict between the requirements of the section and those of the listed documents, the requirements of this section shall prevail.

1. ASTM A322: Carbon and Alloy Steel Bar Specifications
2. ASTM A507-10: Standard Specification for Drawing Alloy Steel, Sheet and Strip, Hot-Rolled and Cold Rolled
3. ABMA, Standard 9-90: Load Rating and Fatigue Life for Ball Bearings

4. ABMA, Standard 11-90: Load Ratings and Fatigue Life for Roller Bearings

5. AWS, D1.1: Structural Welding Code

1.04 SUBMITTALS

A. General

1. Comply with Section 01 33 00.

2. Include a checked-off copy of this specification with deviations noted, per Section 01 33 00.

3. Include a copy of the contract document mechanical layout drawings, control diagrams and process and instrumentation diagrams, with addenda updates, that apply to the equipment in this section.

a. Mark to show specific changes necessary for the equipment proposed in the submittal.

b. If no changes are required, mark the drawing or drawings “No Changes Required”.

c. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

4. In all submitted product data, call out model, configuration, size etc. of proposed equipment and/or cross out model, configuration, size etc. of non-applicable equipment.

a. Failure to comply with this requirement is sufficient cause to reject the entire submittal.

B. Bill of Materials with quantity, originating manufacturer and part number, and description. List all spare parts separately at the end of the Bill of Materials.

C. Product Data

1. Submit manufacturer’s standard catalog data, descriptive literature, motor and drive system data, parts list, equipment weights and lifting points, and detailed specifications describing all system components forming a part of the equipment furnished under this section.

2. Submit coatings information. Refer to Section 09 96 00.

D. Calculations

1. Submit anchor bolt design calculations, stamped and signed by an Oregon registered professional civil or structural engineer. Comply with Sections 01 61 10, and 05 50 01.

2. Calculations documenting the AGMA rating of the drive unit and life of the main bearing for spur and helical gears. For other gearbox types provide manufacturer’s catalog engineered rating of the drive unit and calculated life of the main bearing.

E. Shop Drawings

1. Submit drawings showing the general arrangement of the entire assembly, including:

   a. Dimensional information

   b. Plan and section views of the equipment layout

   c. Location and size of piping connections

   d. Auxiliary equipment locations

2. Submit manufacturer's equipment mounting instructions, requirements and detailed drawings for the installation of the screw press and flocculation reactor.

F. Submit a certificate of Unit Responsibility. See Section 01 99 00.

G. Submit motor data in accordance with Section 11 05 13.

H. Submit equipment mounting information in accordance with Section 46 05 14.

I. Submit a written report on results of factory testing specified in Part 3 below.

J. Submit proposed on-site testing and start-up procedures, including sketches and calculations for specified tests.

K. Manufacturer's Experience and Qualifications

1. Submit a list of at least twenty (20) installations in which the proposed screw press equipment, of similar or larger capacity, including flocculation reactor system, has been installed and is in operation in municipal wastewater treatment applications. Provide installation date, system solids and hydraulic capacities, and owner contact information for each installation.

2. Submit manufacturer's ISO 9001 certification or other QA/QC documentation and forms.

L. Electrical Information

1. Electrical Drawings

   a. Equipment elevations with enclosure details drawn to scale.

   b. Electrical One-line and Elementary diagrams

   c. PLC I/O diagrams

   d. Interconnection diagrams

2. Catalog Data for each component used in the construction of the assembly and control panel:

   a. Instrumentation data summary sheets to include instrumentation type and tag name, description, manufacturer's model number and part number with all proposed options, range, span, engineering units, input and output characteristics.

   b. Description of component as it relates to the model number. For each portion of the model number the associated description shall be shown.

   c. Manufacturer's literature, illustrations, specifications and engineering data including: materials, dimensions, weight, performance, and ordering

information with applicable features and options highlighted, circled, or "arrowed."

1) Manufacturer's data not properly marked will not be accepted for review.

d. Manufacturer's description or equipment features.

e. Physical size and mounting details.

3. Control Panel with Programmable Logic Controller (PLC) and Operator Interface (OI). Submit the following documentation for approval.

a. Complete information, catalog cuts, and Bill of Materials for the control panel hardware, software, and configuration.

b. PLC Ladder diagrams of the control system programming logic.

1) The Supplier shall submit the ladder logic diagrams utilizing AB RX Logix software or copy of ladder logic file compatible with RX Logix.

2) A narrative functional description shall accompany the ladder diagram describing system operation on a line-by-line basis.

c. OI graphic screen printouts for all proposed graphic screens.

d. PLC I/O lists and control descriptions. I/O tags shall be those designated on the Contract Drawings P&IDs.

e. Submit software operations manual including, as a minimum:

1) Program code

2) Tag database

3) Setpoint listings with description

4) Program description

5) Register cross reference listing

6) Configuration and set-up

7) Data tables

8) Special files

f. Electronic copies of proposed PLC ladder logic program listing and OI graphic screens.

M. Complete and submit the following forms from Section 01 99 00:

1. Motor Data Form.

2. Unit Responsibility Form.

3. Extended Warranty Forms.

N. Bench Scale Test Report

1. Manufacturer shall test polymers and make at least two (2) preliminary selections for use during acceptance testing, as specified in 1.05.E.

2. Submit bench test results and polymer selections.

3. Include the following:

   a. Narrative description of equipment used for bench testing

   b. Narrative overview of testing procedures

4. Contractor shall collect samples and ship them to the manufacturer.

O. Deferred Submittals:

1. Factory Tests

   a. Submit certified shop inspection reports indicating that all components of the screw press dewatering equipment have been factory-tested in accordance with the manufacturer's requirements and that the components meet or exceed the requirements of this Section.

   b. Submit a minimum of 10 days prior to equipment shipment.

2. Submit operating and maintenance (O&M) information as specified in Section 01 78 23 a minimum of 10 days before equipment shipment.

3. Submit additional forms required following startup and training per Part 3. Include forms in final O&M manual.

4. Submit certification of shop trial assembly and photographs of assembly a minimum of 10 days before shipment.

5. Submit shop inspection records and evidence of inspector qualification a minimum of 10 days before shipment.

6. Following installation and startup, submit completed Manufacturer's Installation Certification Form.

1.05 QUALITY ASSURANCE

A. Comply with Section 46 05 13.

B. Manufacturer

1. A minimum of 15 years of experience in the design, application, and supply of screw press dewatering equipment in municipal wastewater treatment plants.

2. A minimum of 20 municipal installations in the United States, Europe and/or Australia in operation for more than one year.

C. Unit Responsibility

1. Assign unit responsibility, as specified in Section 46 05 13, to the screw press dewatering equipment manufacturer for the equipment specified in this Section.

2. Manufacturer shall provide screw press, flocculation reactor tank, polymer system including polymer blending unit, mixers, motors, gear reducers, VFDs, controls, control panels, and lifting attachments as a complete integrated package to ensure proper coordination, compatibility, and operation of the system.

D. Coordination

1. Contractor shall coordinate all details of the equipment with other related parts of the work. Contractor shall verify that all structures, piping, wiring and equipment components are compatible. Contractor shall be responsible for all structural and other alterations required to accommodate equipment differing in dimensions or other characteristics from these specifications and the Drawings.

2. Coordinate the design, fabrication and installation requirements for sludge feed piping and pipeline appurtenances not supplied by the screw press manufacturer.

3. Coordinate PLC I/O data table with Application Programmer performing SCADA and PLC programming on other PLCs for the Project.

4. Contractor to coordinate PLC, Ethernet switch and operator interface panel required in this specification with those specified in Sections 11362, 11374 and 11377 so one manufacturer and model of each type of equipment is supplied on this project

E. Bench Scale Testing:

1. Contractor shall provide sludge samples to screw press dewatering equipment manufacturer.

2. Sludge samples shall be obtained by the Owner from existing belt filter press feed before polymer addition. Contractor shall provide sampling instructions to Owner and coordinate scheduling of sampling.

3. Sludge sampling shall be performed at a time when the sludge conditions are within the ranges specified for Condition 1 in paragraph 2.03.

4. Contractor shall be responsible for shipping sludge samples to screw press dewatering equipment manufacturer.

5. Upon receipt of sludge samples, manufacturer shall test polymers and make at least two (2) preliminary selections for use during acceptance testing.

6. Submit bench test results and polymer selections.

1.06 WARRANTY

A. Provide a written extended warranty from the manufacturer for the equipment specified in this Section.

1. Extended Warranty Period: Ten (10) years from successful completion of the demonstration period for the dewatering system.

2. Coverage: Cover defects or failures of materials or workmanship which occur as the result of normal operation and service.

3. Complete the Extended Warranty Form in Section 01 99 00.

B. Screw Press Dewatering Equipment Performance

1. Guarantee screw press dewatering equipment performance as specified in paragraph 2.03 when flow and water quality parameters conform to those specified in paragraph 2.03.

2. Length: 2 years from successful completion of the demonstration period for the dewatering system.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. FKC Co., Ltd. (Port Angeles, WA)

B. Or equal, as specified in Section 01 33 00

2.02 OVERALL SYSTEM REQUIREMENTS

A. Design to receive, flocculate, condition, and dewater the feed sludge specified herein, and neatly discharge the dewatered sludge cake into the existing discharge chute.

B. Design to accommodate municipal secondary wastewater solids without jamming, clogging, or overflow.

C. Design to operate continuously 24 hours per day, 7 days per week or intermittently.

D. Design to operate in both manual and fully automatic modes.

E. Design to operate at variable rates to accommodate varying combinations of sludge concentration, sludge feed rate, and polymer addition, in order to optimize cake solids concentration, capture rate and polymer use. Tracking sludge concentration changes is not required.

F. Screw press shall be capable of retaining a plug of feed and/or dewatered sludge inside the dewatering screen basket for up to 72 hours without adversely impacting screw press components or startup procedures for the subsequent dewatering run.

G. Structural Design

1. Design and manufacture all components to handle the forces that may be exerted during fabrication, shipping, erection, and proper operation according to the O&M manual.

2. Design so that jamming at any point will cause the drive motor to stall without resulting in component damage or structural failure.

a. Provide motor load setpoints in PLC and VFD.

H. Provide drains with the ability to drain all liquid and feed sludge from the dewatering and flocculating equipment and piping.

I. Corrosion Control

1. Equipment design shall not result in crevices, unsealed overlapping plates and similar inaccessible areas where corrosion can take place without allowing access for application of preventive measures.

2. It may be expected that the material discharged to each screw press will be in an actively digesting state.

3. Corrosive agents (moisture, hydrogen sulfide gas, sulfuric acid, etc.) will be present at all times.

J. Inspection, Maintenance, Repair and Adjustment Provisions

1. Provide sufficient room for inspection, maintenance, repair and adjustment.

2. All components shall be so arranged that they can be serviced from the operating floor or from the permanent access platforms shown on the Drawings.

K. The sludge is expected to contain quantities of industrial and municipal wastes including solvents, petroleum products, grit, hair, rags, grease, rubber goods, and organic solids.

2.03 DESIGN CRITERIA & PERFORMANCE REQUIREMENTS

A. Provide screw press equipment suitable for the following conditions:

Item	Value	
	Condition 1	Condition 2
Type of sludge	Waste Activated Sludge	Anaerobically Digested Sludge
Upstream sludge storage/stabilization	Secondary Treatment	Anaerobic Digestion
Feed solids concentration	0.5 – 2.0%	1.0 – 2.5%
Hydraulic Loading Rate	10 gpm, min 100 gpm, max	10 gpm, min 100 gpm, max
Average Solids Throughput	458 dry pounds per hour (per unit)	458 dry pounds per hour (per unit)
Volatile solids ratio	60 – 75	45 - 50
Temperature	45 – 95 ºF	45 – 95 ºF
pH	6.0 – 8.0	6.0 – 8.0
Flocculant	Liquid Emulsion Polymer	Liquid Emulsion Polymer
Maximum polymer consumption, lbs active polymer/dry ton of solids	30	35
Effluent cake solids concentration	15%	18%
Minimum solids capture	95% minimum or 750 mg/L TSS maximum	95% minimum or 750 mg/L TSS maximum

B. Meet the performance requirements with either more than one commercially available polymer, or with a polymer that is commercially available from more than one vendor.

2.04 MATERIALS

A. Screw press and flocculation reactor components shall be manufactured from Type 304 or better stainless steel shapes (rods, angles, and channels), pipes, and sheets unless otherwise specified.

1. This requirement includes, but is not limited to, the following:

a. Screw

b. Screw shaft

c. Perforated plate basket

d. Screw press cover and inspection lids

e. Screw press frame

f. Screw press and flocculation reactor support structures

g. Piping connections

2. Control panel enclosure: Type 316 stainless steel

3. Fasteners and anchor bolts: Type 316 stainless steel or Type 304 stainless steel

4. Minimum stainless steel sheet thickness (excluding cover parts & assemblies): 1/8 inch.

5. Elastomer seals on helical screw flights, if required, shall be wear-resistant nylon or polyurethane. The seals shall be held in place by Type 316 stainless steel clamps and bolts which can be easily removed. Seals shall be replaceable without removal of the screw.

B. Bearings shall be anti-friction, and may be grease lubricated.

2.05 FABRICATION

A. Screw press shall be manufactured in a manner to prevent contamination of the stainless steel with rusty dust.

B. All stainless steel components and structures shall be pickled with nitric acid and hydrofluoric acid to remove any residues that may be present on the material as a result of forming, manufacture, or handling. After pickling, wash the equipment with a high-pressure wash of cold water to remove any remaining surface debris and promote the formation of an oxidized passive layer.

C. Perform all welding in accordance with American Welding Society (AWS) D1.1 Structural Welding Code, or equivalent.

2.06 SCREW PRESS

A. Design the screw press to be installed horizontally.

B. Dewatering of the sludge shall take place in a perforated plate basket, consisting of a minimum of four sections of perforated plate.

1. Provide longitudinal flanges to allow basket disassembly.

C. The screw press shall be completely enclosed to prevent odor emission.

1. The entire dewatering section and basket area shall be easily accessible through inspection lids, which are mounted on the sides of the machine.

2. Minimum five inspection lids each side of screw press.

3. Inspection lids shall be easily removed and contain all liquids and aerosols resulting from normal dewatering and spray washing operations.

a. Lifting weight of each inspection lid shall be limited to 21 lbs.

D. Employ a shafted, helical screw installed inside of the screen basket to transport sludge from the inlet to the discharge area at the end of the pressure zone.

1. A shaftless screw is not acceptable.

2. Taper up screw shaft diameter towards the discharge section of the machine.

3. A bearing shall support the drive end of the screw shaft. Wear strips are not acceptable.

E. Drive motor

1. Location

a. FKC: Provide an in-line, flange mounted motor at the inlet end of the screw press.

b. Other manufacturers: The screw press drive motor may be located at either end of the screw press.

2. Motor speed shall be controlled with a VFD.

3. Gear drive unit shall be directly coupled to the screw shaft.

4. Motor shall be directly coupled to the gear reducer or may drive the gear reducer using a belt drive.

5. All motor couplings and other high-speed rotating parts shall be provided with OSHA-approved guards.

F. Clean the perforated screen basket from the outside using a spray bar washing system made of stainless steel piping and stainless steel or PVDF spray nozzles. Plastic nozzles are not acceptable.

1. Cleaning shall not interrupt dewatering operation.

2. The spray area shall cover the entire length of the screen. One or more solenoid valves shall control the flow to the spray bar washing system.

3. Clean the entire surface area of the basket during each cleaning cycle.

4. Provide minimum 1.25-inch connections for cleaning water supply connections to the spray system.

5. Water pressure at each nozzle of the spray bar shall be a minimum of 40 PSIG.

6. Average spray water consumption shall not exceed 72 gallons at 40 PSIG per wash cycle.

G. If required, provide a pneumatically actuated cone to adjust the pressure in the pressure zone at the discharge end of the screening basket.

1. Adjust pressure on the cone manually through an air pressure regulator installed on the screw press

2. Provide a one-quarter inch (1/4”) industrial style stainless steel female quick coupler for pressurized air supply connection at the manifold of the pneumatic system.

H. Sludge cake shall be automatically discharged through a rectangular sludge discharge opening.

I. Screw Press Drive

1. The press screw shall be driven by a shaft mounted gearbox or speed reducer, and an electric motor

   a. The gear reducer or speed reducer shall be bolted to a machined flange welded to the inlet end of the press.

   b. The motor may be bolted directly to the gear reducer or speed reducer, or may drive the gear reducer using a belt drive.

   c. Minimum L-10 bearing life of motor and gear reducer or speed reducer: 100,000 hours.

2. Gear Reducer:

   a. Maximum gear reducer output speed: 0.35 rpm at 100 percent motor speed.

   b. AGMA Class 2, service factor 1.5

3. Drive motor:

   a. Comply with Section 11 05 13.

   b. Type 2 Motor, inverter-duty, NEMA Design B.

   c. Minimum service factor: 1.15

   d. Size: maximum 2 hp

   e. Power: 480 volt, 3 phase, 60 Hertz.

   f. Nominal maximum speed: 1,800 rpm.

J. Piping connections:

1. All piping connections 3 inches or larger shall be ANSI, Class 150 standard raised face flanges:

   a. Single 6-inch or larger bottom drain connection for conveyance of screw press filtrate

   b. 6-inch minimum diameter inlet connection for feed sludge

2. All piping connections 2.5 inches and smaller shall be threaded

   a. 2-inch diameter connection for cleaning water supply on top of press

   b. 1.5-inch diameter connection for cleaning water supply at sludge inlet

   c. 1.5-inch diameter connection for cleaning water supply at drive

K. Headbox Level Transmitter

1. Provide pressure sensor for level with 4-20mA output.

2. IFM eFector PI-001BREZ02-MFRKG/US, or approved equal

2.07 UTILITY WATER MANIFOLD

A. Provide utility water manifold and water panel per P&ID drawing I-251.

B. Manifold shall have a common 2-inch header that serves three separate wash water headers.

C. A flow switch shall be provided on the 2-inch common header.

D. Each wash water header shall be provided with the following

1. Solenoid valve
2. Isolation ball valves
3. Bypass pipe

2.08 FLOCCULATION TANK

A. Provide a flocculation tank for mixing and aging of polymerized sludge prior to dewatering.

B. Construct wetted parts of Type 304 or better stainless steel.

C. Include anti-rotation baffles.

D. Design for a retention time of 2.0 – 4.0 minutes at the design flow rate.

E. Minimum tank volume shall be 285 gallons.

F. Locate the inlet at the bottom and the conditioned sludge outlet near the top of the tank.

G. Provide a mixer.

1. Motor size: 1.0 hp minimum, 1,800 rpm, 480 volts, 3 phase.
2. Drive:
    a. Variable speed drive with shaft speed range of 13-64 rpm
    b. Gear reducer: SEW Eurodrive Varimot Variable Speed Gearmotor, Nord, or equal.
3. Control speed through dewatering system control panel.

H. Provide stainless steel support structure for flocculation chamber, including mounting hardware.

I. Provide the capability to visually inspect floc formation, either directly in the flocculation tank, or in discharge piping.

J. Piping connections:

1. 4-inch diameter ANSI, Class 150 standard raised face flange, bottom connection for inlet sludge
2. 8-inch diameter pipe stub with flexible coupling outlet connection for polymer conditioned sludge

K. Flocculation Tank High Level Alarm

1. Provide level switch in the tank for high-high level alarm.
2. Provide Warrick 16MA1B0, or approved equal.

2.09 POLYMER BLENDING AND INJECTION SYSTEM

A. Provide a skid mounted polymer blending unit per Section 46 33 33.

B. Polymer blending unit shall meet the following requirements:

1. Designed to activate liquid emulsion polymer.

2. Capable of mixing, blending and aging liquid polymer on a continuous basis to meet screw press requirements.

3. Include a neat polymer pump and hose connections that allow for polymer to be withdrawn from either 55-gallon drums or 275-330-gallon IBCs (totes).

2.10 SHAFTLESS SCREW CONVEYORS

A. Provide shaftless screw conveyors per 41 12 13

2.11 COATINGS

A. Factory coat non-stainless steel components per Section 09 96 00.

2.12 CONTROL PANEL

A. A control panel shall be provided for controlling the screw press, flocculation tank, polymer blending unit, and conveyors specified in this Section.

B. The control panel shall be cooled to maintain the operating temperatures of all components inside the control panel.

C. The control panel shall be rated for 65,000 AIC minimum.

D. The control panel shall meet the requirements of Section 40 78 00 Panel Mounted Equipment.

E. The Control Panel shall have the following components

1. Housing

a. Provide stainless steel, NEMA 4X enclosure per 40 78 00.

2. Switches and Indicator Lights

a. Provide switches and indicators per 40 78 00

b. Flocculation Tank Mixer

1) Local-Off-Remote switch

2) On-Off-Auto switch

3) Running indicator

4) Failure indicator

5) Speed selector switch

c. Screw Press

1) Local-Off-Remote switch

2) On-Off-Auto switch

3) Running indicator

4) Failure indicator

5) Speed selector switch

d. Conveyor

1) Local-Off-Remote switch

2) On-Off-Auto switch

3) Running indicator

4) Failure indicator

5) Speed selector switch

3. Hardwired Alarms

a. Provide at minimum the following hardwired input alarms that shall be monitored by the control panel:

1) 120VAC Power OK

2) Floc Tank Level Switch Hi-Hi

3) Floc Tank Mixer In-Auto

4) Floc Tank Mixer Running

5) Screw Press In-Auto

6) Screw Press Running

7) Screw Press Fail

8) Polymer System In-Auto

9) Polymer System Running

10) Polymer System Trouble

b. Provide at minimum the following hardwired outputs from the control panel:

1) Floc Tank Mixer Run Command

2) Screw Press Run Command

3) Polymer System Run Command

c. Provide at minimum the following analog inputs that shall be monitored by the control panel:

1) Floc Tank Mixer Speed Feedback

2) Screw Press Speed Feedback

3) Screw Press Headbox Level

4) Wastewater Solenoid 1 Open Command

5) Wastewater Solenoid 2 Open Command

6) Wastewater Solenoid 3 Open Command

d. Provide at minimum the following analog outputs from the control panel:

1) Sludge Feed Pump Speed Command

2) Floc Tank Mixer Speed Command

3) Screw Press Speed Command

4) Polymer System Speed Command

4. Touch Screen

a. Touch screen shall be Allen Bradley PanelView Plus 7 Color touch screen in minimum 15" size with minimum 640x480 resolution, 120VAC or approved equal.

b. Provide the following control functions on the touch screen, where applicable:

1) Auto/Manual Selection

2) Sludge Feed Flow

3) Screw Press Speed

4) Polymer Water Feed Rate

5) Alarm Silence

6) Alarm Reset

7) Manual Start/Stop

8) Screen Contrast

9) Low Polymer Water Fault

10) Washwater Selection

11) Automation Set Points

a) Feed sludge flow rate

b) Polymer dose relative to flow

c) Headbox level

c. Display the following on the touch screen:

1) Sludge feed flow (gpm)

2) Screw press speed (rpm)

3) Diluted polymer solution feed rate (gpm)

4) Neat polymer feed rate (gph)

5) Automation Status

6) Polymer Pump Status

7) Alarm indications

8) Fault History

5. Variable Frequency Drives

    a. AB Powerflex 525 series

    b. Variable frequency drives (VFDs) shall be provided for the screw press and flocculation tank

    c. Each variable frequency drive (VFD) shall be provided as a standalone unit. The VFD shall be of the latest technology capable of driving variable or constant torque motor loads at variable speeds to control and/or maintain a process variable (level, flow, pressure, etc.) by varying the motor speed. The VFD shall have the following attributes:

    d. The VFD shall use high efficiency sinusoidal PWM (pulse width modulation) control of IGBT power transistors.

    e. Alpha-numeric human interface module (HIM) digital display with keypad to view and adjust diagnostic and status indicators. HIM shall be on VFD inside panel enclosure.

    f. Continuously operable in ambient temperatures, 25°F to 110°F (-4°C to 43°C), and relative humidity, 95% non-condensing.

    g. Automatic fault reset to automatically restart the drive after any type of fault condition -- up to three attempts. When the drive is locked out after its automatic reset attempts the operator shall be able to reset the VFD by cycling power or via keypad.

    h. Digital inputs for start, preset speed and direction; relay outputs for alarm and run; 4-20 mA input for speed command; 4-20 mA output for speed indicator.

6. VFD Line Reactors

    a. Hammond Power Solutions CRX Series, or approved equal.

    b. Reactor construction shall be iron core with a minimum impedance of (3) percent.

    c. Reactor windings shall be copper or aluminum wound.

    d. Reactor insulation shall be Class H with a 115 degree C rise over 50 degree C ambient.

    e. Reactor shall be rated for system voltage and frequency.

7. Programmable Logic Controller (PLC)

    a. Allen Bradley CompactLogix 1769-L3X series, or 5069-L3X series.

    b. PLC shall have no imbedded input/output (I/O) controllers.

    c. Provide input/output (I/O) modules as required for a functional system as specified.

8. Unmanaged Ethernet Switch

    a. Allen Bradley 1783-US8T, or approved equal.

b. Ethernet switch shall be modular style, suitable for use in harsh industrial environments.

c. Switch shall be UL Listed and EtherNet/IP Certified.

d. Port count shall be at minimum (8).

e. Copper Ethernet connectors shall be RJ45.

9. Control Power Transformer

a. Shall be GE, Hammond Power Solutions, or approved equal.

b. Shall be 480VAC, 1-phase primary and 120/240VAC 1-phase secondary.

c. Minimum output shall be 3000VA.

10. Uninterruptible Power Supply (UPS)

a. Control panel shall include an uninterruptible power supply for backup power.

b. Power supplies shall be rated for 1000VA, 120VAC, 60Hz.

c. Power supplies shall be UL508 listed

11. Programmable Logic Controller (PLC)

a. CompactLogix 1769-L3xER series CPU with standalone I/O

12. Programming

a. Provide all programming of PLC and OIT per this specification Section and Section 40 61 916.13 Control Descriptions. All programming shall be ladder code only.

b. Provide graphics on OIT to be migrated to plant SCADA system as part of a future project.

c. Program all alarms using the "ALMA" & "ALMD" blocks in the PLC to report to an Alarm Server installed as a future project. Also provide a digital output to a Relay that includes all Dialout Critical Alarms. This will be used to trigger a Banner Radio signal to a Dialer System. Radio and dialer system installed by others.

2.13 OTHER ELECTRICAL COMPONENTS

A. Manufacturer shall provide provisions for separate power and communication utility connections. Provide two junction boxes, sized by the Manufacturer, for power and communication. Provide power distribution blocks, including grounding provisions, for the power connection. Provide a grounded RJ45 connection, suitable for accepting 600-volt, CAT6 Industrial Ethernet cabling. The boxes shall be sized to include adequate space for terminations and cable bending radii as required by UL and the NEC.

B. All equipment-mounted conduit shall be PVC-coated galvanized steel conduit or 2-foot maximum length non-metallic liquid tight conduit.

2.14 SPARE PARTS

A. The following spare parts shall be included and supplied together with the equipment:

1. One (1) set of helical screw flight seals with mounting hardware (if required)

2. One (1) set bearing assemblies for screw shaft

3. One (1) solenoid valve of each size for spray bar washing system

4. Ten (10) nozzles for spray bar washing system

B. Spare parts shall be packaged with labels indicating the contents of each package, and shall be delivered to Owner as directed.

PART 3 - EXECUTION

3.01 FACTORY TESTING

A. All major system components shall be factory tested for compliance with the construction and functional requirements specified herein. A copy of the test reports, certified by an officer of the Supplier, shall be submitted prior to shipment.

3.02 WIRE MARKING

A. All panel, enclosure and field wiring shall have wire labels on both ends of each wire. Labeling shall be neatly installed for visibility and shall be clearly legible. Each conductor of instrument shielded signal wiring shall be labeled. Wire labels shall be machine printed with on white heat shrinkable tubing. Each label shall fit a minimum 23 characters, 3/16" in height before shrink. Tubing shall be oversized for the wire and shrunk into place using an electric heat gun. The "shrunk" label shall have just enough give to allow the label to be rotated. Hand lettered wire labels are not acceptable and shall be replaced at the Supplier's expense. Provide Brady "PermaSleeve" or approved equal.

B. Wiring Methods:

1. Wiring Separation: Wires carrying 100 volts and above shall be physically separated from lower voltage wiring by using separate bundles or wire ways with sufficient distance to minimize the introduction of noise, crossing only at 90 degree angles.

2. Harness: All wiring shall be neatly bundled and laced with plastic tie-wraps, anchored in place by screw attached retainer. Where space is available, wiring shall be run in slotted plastic wireways with dust covers. Wireways shall be sized such that the wire fill does not exceed 60%. Tie-wraps shall be T&B TY-RAP or approved equal.

3. Retainers: Wireways, retainers, and other devices shall be screw mounted with round-head 316 stainless steel screws or mechanically mounted by push-in or snap-in attachments. Glue or sticky back attachment of any type or style shall not be used. Retainers shall be T&B TC series or approved equal.

4. Hinge Loops: Where wiring crosses hinged surfaces, provide a "U" shaped hinge loop protected by clear nylon spiral wrap. The hinge loop shall be of sufficient length to permit opening and closing the door without stressing any of the terminations or connections. Spiral wrap shall be Graybar T25N or approved equal.

5. Routing: Wires and cable shall be routed along the shortest route between termination points, excepting routes which would result in routing 120 VAC and other wires and cables in the same duct or bundle. Wires and cables shall have sufficient length to allow slack and to avoid any strain or tension in the wire or cable.

6. Wires shall be routed in slotted plastic wireways with snap covers. Wires carrying 120 VAC shall be separated as much as possible from other wires and signal cables, and shall be routed only in ducts for 120 VAC. If the power wiring has to cross the signal wiring, the crossing shall be as close to a right angle as possible. Wireways for 24 VDC wiring shall be used for all other wires and cables. Routing of 120 VAC in combined wireways shall be minimized. Wires and cables shall be placed in the wireways in a straight, neat and organized fashion and shall not be kinked, tangled or twisted together. Additional wire ducting shall be provided for use by the electrical subcontractor for routing field wires to their landing points in the each electrical and instrumentation panel.

7. Provide 2" minimum separation between wireway and terminal blocks.

8. Wiring not routed in wireways shall be neatly bundled, treed, and laced with plastic ties.

3.03 ELECTRICAL CONSTRUCTION METHODS

A. Mating fittings, bulkhead fittings, plugs, connectors, etc. required to field interface to the equipment and panels shall be provided by the when the equipment is delivered.

B. All electrical and instrumentation drawings associated with the equipment shall be provided with the equipment when it is delivered to the job site. Drawings for each piece of equipment shall be placed in clear plastic packets of sufficient strength that will not tear or stretch from drawing removal and insertion.

C. Electronic PDF version of O&M, electrical and instrumentation drawings associated with the equipment and electronic copies of the PLC and OI programs shall be provided on a USB drive with no password protection on a lanyard and placed within the panel. Label drives with clear plastic with black machine printed lettering as produced by a KROY or similar machine. The size of the nameplate tape shall be with 3/8-inch lettering unless otherwise approved by the Engineer. Securely fasten nameplates in place on the USB drive using the adhesion of the tape.

3.04 SHIPMENT AND STORAGE

A. Comply with Section 01 66 00.

B. Site Storage and Handling of Equipment

1. Store the supplied equipment in accordance with the manufacturer's recommendations and instructions.

2. Store gear reducers / speed reducers and motors in buildings or trailers and protected from dust, dirt, and moisture.

3. Take responsibility for work, equipment, and materials until inspected, tested and finally accepted.

3.05 INSTALLATION

A. The equipment Supplier's representative shall be available by telephone as required during construction. During equipment installation, the Supplier's representative shall visit the site as needed to insure that the installation is in compliance with the Supplier's recommendations and instructions, and the requirements of this Proposal.

B. Contractor shall provide temporary or rental hoisting equipment to facilitate installation.

3.06 SUPPLIERS' CERTIFICATION

A. Prior to system startup and functional testing, all equipment described herein shall be inspected by the Supplier's representative for proper alignment, proper connection, and satisfactory performance of all components.

B. The Supplier's representative shall approve installation and provide certification using Manufacturer's Installation Certification Form in Section 01 99 00.

3.07 EQUIPMENT START-UP AND TESTING

A. Comply with Section 01 81 00.

B. Proposed test procedures shall be developed by the installation screw press equipment Supplier's representative. The procedures shall be submitted to the Owner and installation Contractor and reviewed by the Owner before scheduling and performing the functional test.

C. Testing shall be conducted by the Supplier's representative and installation Contractor and witnessed by the Owner. The testing shall demonstrate that the dewatering equipment and related control system operate in accordance with the specifications including all operating, monitoring, and shutdown functions. Testing shall also demonstrate that the performance of the system is stable and not subject to hunting, over-adjustments, and cycling of components.

D. Pre-Operational & Functional Testing

1. Comply with Section 01 81 00 – 3.02 & 3.03.

2. If, in the opinion of the Owner, the system meets the requirements specified herein, the system will advance to performance testing. If, in the opinion of the Owner, the pre-operational and functional test results do not meet the requirements specified herein, the system will be classed as nonconforming.

3. In the case of a nonconforming system, advancement to subsequent testing and monitoring will not commence until the system is classed as conforming. The dewatering equipment Supplier's representative shall make, at no additional cost to the Owner, such adjustments, changes, and/or additions as are necessary to correct the system and retest it as specified above until, in the opinion of the Owner, the system has conformed to these Specification.

E. Performance Testing

1. The screw press equipment Supplier's representative shall start up and operate the dewatering system continuously for two (2) eight-hour day shifts to demonstrate compliance with the performance requirements in paragraph 2.03.

2. Performance must be demonstrated at the minimum and maximum solids and hydraulic loading rates specified in paragraph 2.03.

3. Supplier shall be responsible for selecting and providing polymer used throughout the performance testing and demonstration. These activities shall comply with the following:

   a. Select one or more initial polymers based on bench scale testing specified in paragraph 1.05.E.

   b. Select initial polymer(s) based on sludge samples taken no more than one (1) month prior to the demonstration period.

   c. Selected polymer(s) shall be commercially available from more than one vendor.

   d. Inappropriate polymer selection(s) shall not relieve the Supplier from complying with performance or demonstration period requirements.

   e. Supplier shall provide all polymer required to operate the screw press dewatering system until the Supplier has been notified of the official acceptance of the dewatering system. Supplier shall provide to the Owner contact information for the polymer vendor(s) which provide the polymer(s) used during the performance and demonstration periods.

4. Supplier shall endeavor to optimize polymer consumption for the dewatering equipment. Upon achieving the specified performance requirements during the two-day performance test specified above, Supplier's representative shall vary the polymer dose between 80% and 120% of the dose used for the successful two-day performance test, in increments of 10%, and provide to the Owner a written summary of the resulting dewatering performance parameters, including cake solids concentration and solids capture percentages

5. Contractor shall coordinate with the Owner to ensure that there is a sufficient volume of sludge stored in the aerobic digester to provide feed stock for the performance testing and the demonstration period specified in Paragraph 3.08.F.

F. Demonstration Period.

1. Following the successful two-day operational test as specified above, the screw press equipment Supplier's representative shall conduct the demonstration period testing specified in this Section.

2. Operate facility for four (4) eight-hour day shifts within a period of two (2) calendar weeks with plant personnel present. The system must operate under automatic controls continuously and meet the performance requirements specified in Paragraph 2.03 at all times during the test. Operator interface or adjustments must not exceed once per hour.

3. During the demonstration period, collect samples for cake solids and capture analysis after each two-hour period of operation.

4. Following the demonstration period, produce a report of the test results. For each sample, list the following:

    a. Date

    b. Time

    c. Sludge feed rate (gpm)

    d. Sludge feed concentration (%)

    e. Polymer feed rate (lb/dry ton)

    f. Cake solids (%)

    g. Capture rate (%)

5. The Supplier shall be responsible for all aspects of sampling and analysis during the demonstration period.

6. At the conclusion of one of the day shifts described above, the dewatering system must be shut down automatically after a two (2) hour time delay. Automatic shutdown operations must include a washdown cycle (mandatory) and the expulsion of thin and dewatered sludge inside the screw press (if required by Supplier's typical operation). No operator interface or adjustments may be made during the programmed time delay or during the automatic shutdown operations.

7. For a continuous 4-hour period, the facility must operate at the specified maximum solids loading rate or hydraulic loading rate, whichever is limiting, while producing a minimum average sludge concentration of 15 percent and a minimum average capture rate of 95% or maximum filtrate solids of 750 mg/L TSS, as reflected in the performance requirements listed. No operator interface or adjustments may be made during this period.

8. The above requirements must be met using 100% feed sludge from the subject facilities without any sludge conditioning or other supplemental additions, other than the polymer indicated.

G. If, in the opinion of the Owner, the system meets the performance requirements specified herein during the testing specified above, the Owner will notify the Supplier of the official acceptance of the dewatering system.

H. If, in the opinion of the Owner, the system does not meet the performance requirements specified herein during the testing specified above, the Owner shall notify the Supplier in writing of the nonacceptable performance.

1. In the case of nonacceptable performance, the Supplier shall then have 45 days in which to perform at the Suppliers' expense, any supplemental testing, equipment adjustments, changes or additions and request an additional retest of the nonacceptable system.

2. Time required by the Supplier to perform such measures shall not relieve the Contractor from compliance with the completion times specified in Section 00510 (Construction Agreement).

3.08 MANUFACTURER FIELD SERVICES

A. Provide field inspection and instruction services by a factory trained service representative of the manufacturer. Services by a sales representative are not acceptable.

1. Provide a minimum of two visits, each of a three-day duration, 8-hour minimum work hours per day, travel time excluded, for assistance during installation, equipment startup and testing.

2. Submit a Manufacturer's Certificate of Installation (Section 01 99 00).

B. Provide a minimum of 8 hours over two days, excluding travel time, to train plant operators.

1. Comply with Section 01 79 00.

2. Conduct training sessions for Owner's staff in the proper operation and maintenance of the equipment, including all instrumentation and controls.

3. Conduct training during the latter portion of the functional testing when the equipment is fully operational and before the equipment's Demonstration Period.

4. Include orientation of the Owner's staff to the operation and maintenance information provided by the Equipment Supplier.

5. Include a complete disassembly and re-assembly of all major parts and components of one screw press unit.

6. Submit a Manufacturers Instruction Certification Form. (Section 01 99 00).

C. Make additional site visits as required to comply with these specifications at no additional cost to the Owner.

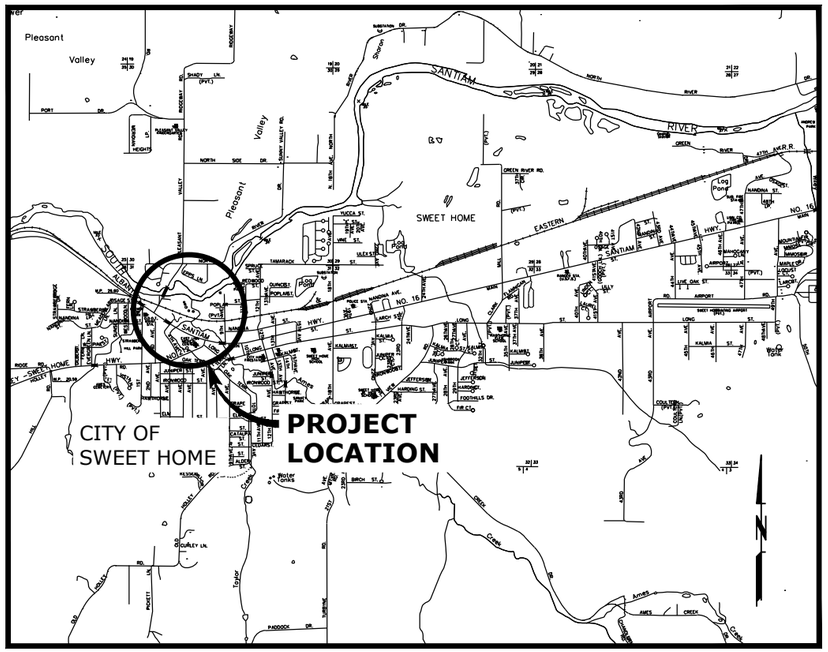
END OF SECTION

Exhibit A

Drawings

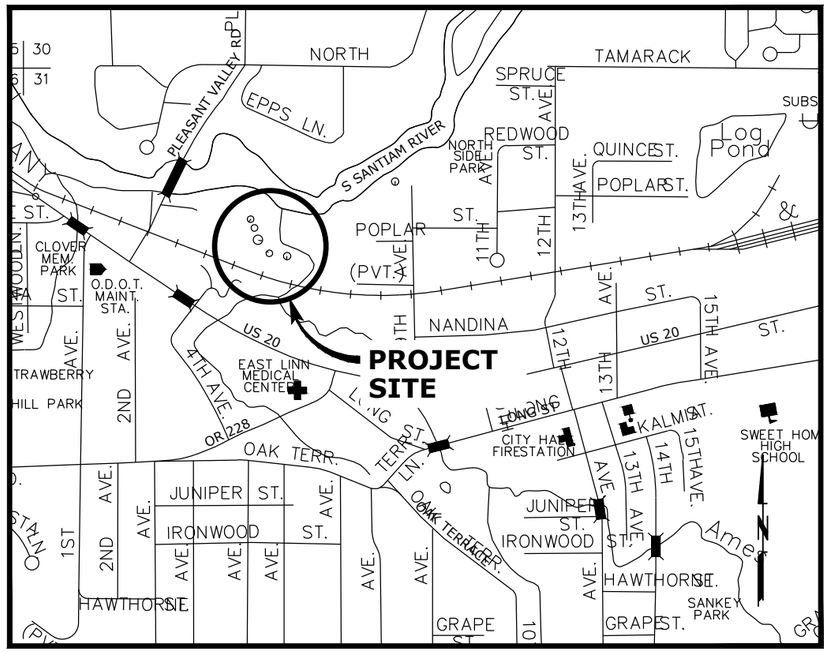
MAHLER WRF OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

DECEMBER 2022



VICINITY MAP

SCALE: 1"=2000'



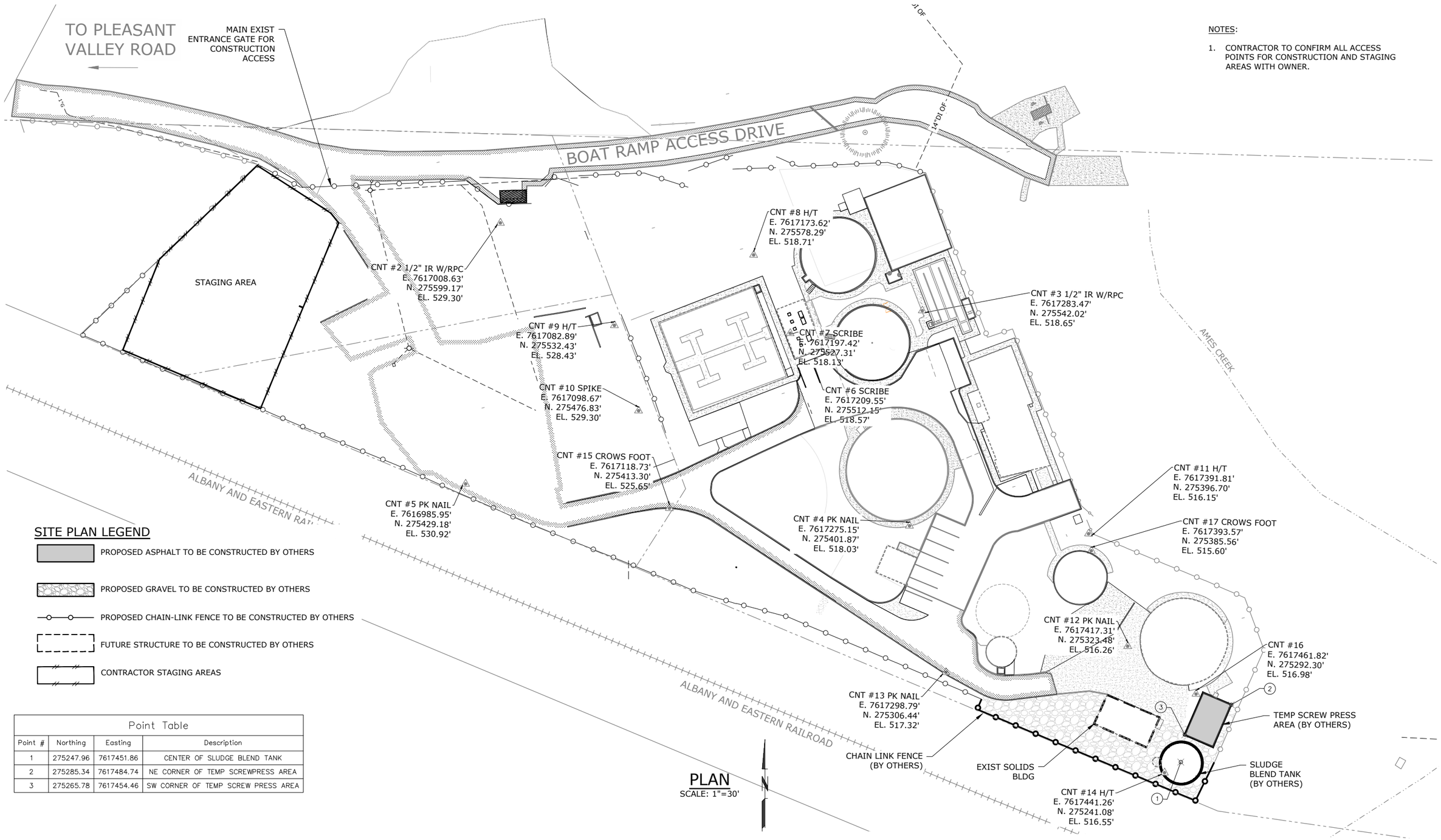
LOCATION MAP

SCALE: 1"=500'

ATTENTION: OREGON LAW REQUIRES THE CONTRACTOR TO FOLLOW THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. THE CONTRACTOR MAY OBTAIN COPIES OF THE RULES BY CALLING THE UTILITY NOTIFICATION CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-246-6699.)

Missing or invalid reference
File: .\19-2605-OR-G\Related data\Technical Resources\CAD Resources\Logos\West Yost\2020 LOGOS\Plan Logo.pdf
Sheet: 1

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NOTES:

1. CONTRACTOR TO CONFIRM ALL ACCESS POINTS FOR CONSTRUCTION AND STAGING AREAS WITH OWNER.

SITE PLAN LEGEND

- PROPOSED ASPHALT TO BE CONSTRUCTED BY OTHERS
- PROPOSED GRAVEL TO BE CONSTRUCTED BY OTHERS
- PROPOSED CHAIN-LINK FENCE TO BE CONSTRUCTED BY OTHERS
- FUTURE STRUCTURE TO BE CONSTRUCTED BY OTHERS
- CONTRACTOR STAGING AREAS

Point Table

Point #	Northing	Easting	Description
1	275247.96	7617451.86	CENTER OF SLUDGE BLEND TANK
2	275285.34	7617484.74	NE CORNER OF TEMP SCREWPRESS AREA
3	275265.78	7617454.46	SW CORNER OF TEMP SCREW PRESS AREA

PLAN
SCALE: 1"=30'

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

BVB DESIGNED
BVB DRAWN
WJM CHECKED

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION
DEC 2022
West Yost

WEST YOST
Water. Engineered.

Sweet Home Oregon at it's best!

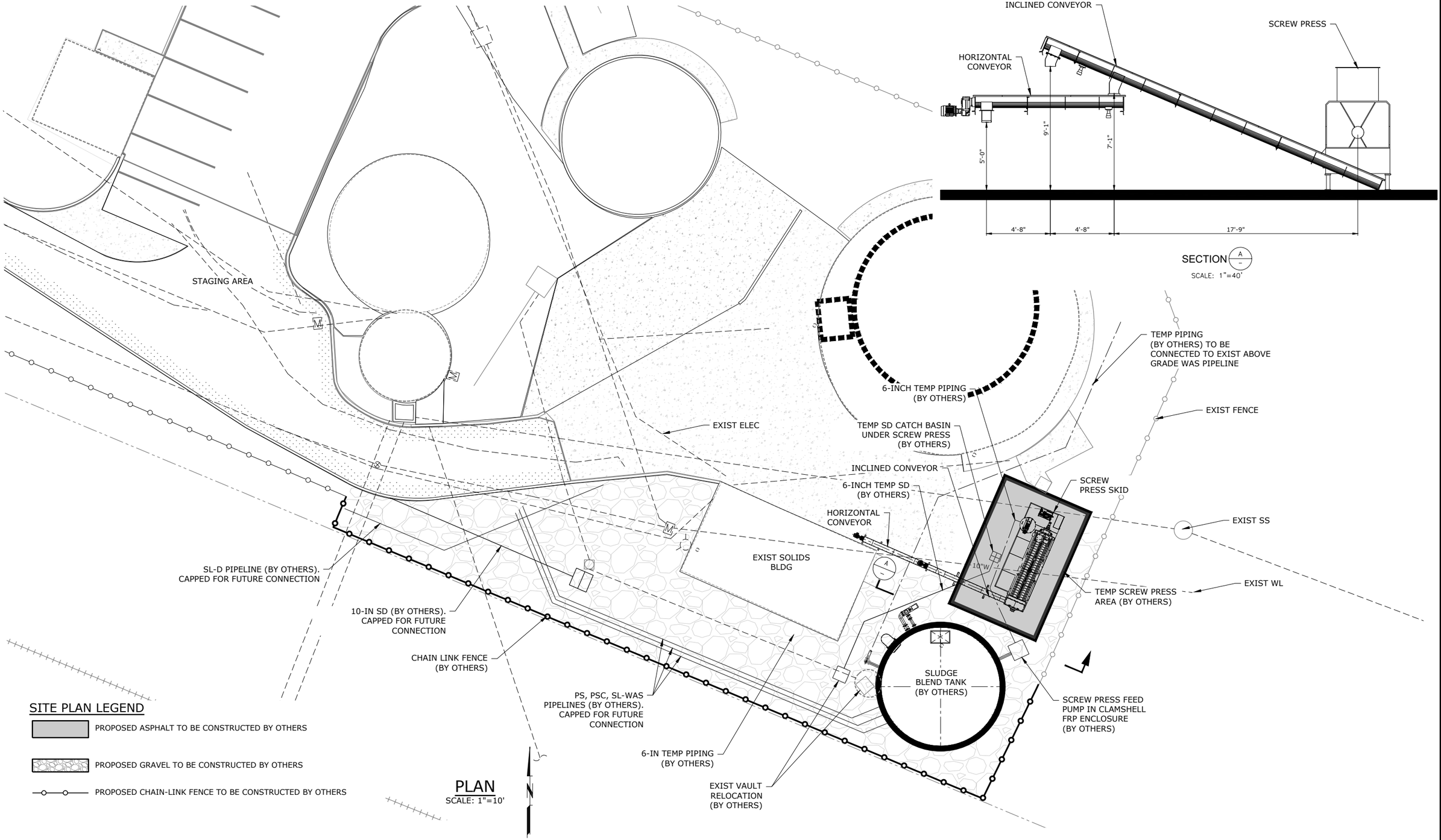
MAHLER WRF
OWNER-PROVIDED
DEWATERING EQUIPMENT
PROCUREMENT

OVERALL SITE PLAN, STRUCTURE COORDINATES, STAGING AND ACCESS, SURVEY CONTROL POINTS

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: DECEMBER 2022

SHEET
C-010
2 of 3

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NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

BVB DESIGNED
BVB DRAWN
WJM CHECKED

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WEST YOST
Water. Engineered.

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MAHLER WRF
OWNER-PROVIDED
DEWATERING EQUIPMENT
PROCUREMENT

SOLIDS AREA DETAIL PLAN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: DECEMBER 2022

SHEET
C-020
3 of 3

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GENERAL INSTRUMENT SYMBOLS

LOCATION/ACCESSIBILITY	DISCRETE INSTRUMENTS	SHARED DISPLAY AND CONTROL (DCS)	PLC	DISCRETE HARDWARE INTERLOCK
FIELD MOUNTED 1. FIELD OR LOCALLY MOUNTED. 2. ACCESSIBLE TO AN OPERATOR AT DEVICE.	○	○	◇	◇
PRIMARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR 1. CENTRAL OR MAIN CONTROL ROOM. 2. FRONT OF MAIN PANEL OR CONSOLE MOUNTED. 3. VISIBLE ON VIDEO DISPLAY. 4. ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.	⊖	⊖	◇	
PRIMARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR 1. CENTRAL OR MAIN CONTROL ROOM. 2. REAR OF PANEL OR CABINET MOUNTED. 3. NOT VISIBLE ON VIDEO DISPLAY. 4. NOT NORMALLY ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.	⊖	⊖	◇	
AUXILIARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR 1. SECONDARY OR LOCAL CONTROL ROOM. 2. FIELD OR LOCAL CONTROL PANEL. 3. FRONT OF SECONDARY OR LOCAL PANEL MOUNTED. 4. VISIBLE ON VIDEO DISPLAY. 5. ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.	⊖	⊖	◇	
AUXILIARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR 1. SECONDARY OR LOCAL CONTROL ROOM. 2. FIELD OR LOCAL CONTROL PANEL. 3. REAR OF SECONDARY OR LOCAL PANEL OR CABINET MOUNTED. 4. NOT VISIBLE ON VIDEO DISPLAY. 5. NOT NORMALLY ACCESSIBLE TO AN OPERATOR AT DEVICE OR CONSOLE.	⊖	⊖	◇	

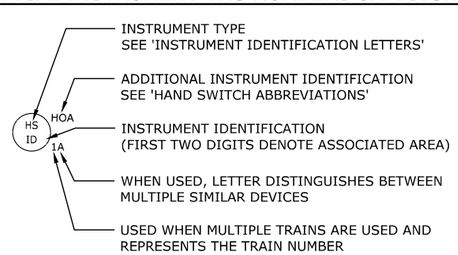
ABBREVIATIONS

AB	AERATION BASIN	MTL	MATERIAL
AG	ABOVE GROUND	MCC	MOTOR CONTROL CENTER
ATM	ATMOSPHERE	MCP	MAIN CONTROL PANEL
BL	BATTERY LIMIT	MIN	MINIMUM
BTL	BOTTOM TANGENT LINE	MOV	MOTOR OPERATED VALVE
BYP	BYPASS	MW	MANWAY
CC	CHEMICAL CLEANOUT	NC	NORMALLY CLOSED
CL	CENTERLINE	NNF	NORMALLY NO FLOW
CO	CLEANOUT	NO	NORMALLY OPEN
CONN	CONNECTION	NOZ	NOZZLE
CSC	CAR SEAL CLOSED	O/C	OPEN/CLOSE
CSO	CAR SEAL OPEN	O/O	ON/OFF
CTR	CENTER	OIT	OPERATOR INTERFACE TERMINAL
DCS	DISTRIBUTED CONTROL SYSTEM	OP	OUTPUT
DES	DESIGN	OSBL	OUTSIDE BATTERY LIMITS
DIA	DIAMETER	OVHD	OVERHEAD
DP	DESIGN PRESSURE	PECS	PRIMARY EFFLUENT CONTROL STRUCTURE
D/P	DIFFERENTIAL PRESSURE	PC	PRIMARY CLARIFIER
DRN	DRAIN	PICS	PRIMARY INFLUENT CONTROL STRUCTURE
DT	DESIGN TEMPERATURE	PLC	PROGRAMMABLE LOGIC CONTROLLER
DWG	DRAWING	PRESS	PRESSURE
(E)	EXISTING	PV	PROCESS VARIABLE
EL	ELEVATION	(R)	RELOCATED
ESD	EMERGENCY SHUTDOWN	REQD	REQUIRED
FOF	FACE OF FLANGE	RIO	REMOTE IO PANEL
(F)	FURNISHED	RTD	RESISTANCE TEMPERATURE DETECTOR
FC	FAIL CLOSED	SC	SECONDARY CLARIFIER
FI	FAIL INDETERMINATE	SCH	SCHEDULE
FL	FAIL LOCKED (LAST POSITION)	SD	SHUTDOWN
FLG	FLANGE	SG	SPECIFIC GRAVITY
FO	FAIL OPEN	SIS	SAFETY INSTRUMENTED SYSTEM
FP	FULL PORT	SO	STEAM OUT
FV	FULL VACUUM	SP	SET POINT
GO	GEAR OPERATED	SS	STAINLESS STEEL S/S START/STOP
GR	GRADE	STD	STANDARD
HC	HOSE CONNECTION	T/C	THERMOCOUPLE
HDR	HEADER	TDH	TOTAL DIFFERENTIAL HEAD
HH	HAND HOLE	TEMP	TEMPERATURE
HOA	HAND/OFF/AUTOMATIC	THRD	THREADED
HP	HIGH PRESSURE	TYP	TYPICAL
HPT	HIGH POINT	UG	UNDERGROUND
IAS	INSTRUMENT AIR SUPPLY	UV	ULTRAVIOLET
ISBL	INSIDE BATTERY LIMITS	UVT	ULTRAVIOLET TRANSMITTANCE
LC	LOCKED CLOSED	UVI	ULTRAVIOLET INTENSITY
LCP	LOCAL CONTROL PANEL	VNT	VENT
LO	LOCKED OPEN	VAC	VACUUM
LP	LOW PRESSURE	VB	VORTEX BREAKER
LPT	LOW POINT	VFD	VARIABLE FREQUENCY DRIVE
MAX	MAXIMUM	W/	WITH
MLCS	MIXED LIQUOR CONTROL STRUTURE	W/O	WITHOUT

INSTRUMENT IDENTIFICATION LETTERS

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, FLAME, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE (TYPICALLY CONDUCTIVITY - ELECTRICAL)			CONTROL, COMMAND	CLOSED
D	USER'S CHOICE (TYPICALLY DENSITY OR SPECIFIC GRAVITY)	DIFFERENTIAL			DIVERT
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE OR GAUGING (DIMENSIONAL)		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE (TYPICALLY MOISTURE OR HUMIDITY)	MOMENTARY			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY OR HEAT DUTY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	THROUGH
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE, TORQUE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TYPICAL INSTRUMENT TAG NUMBERS & DESIGNATION



HAND SWITCH ABBREVIATIONS

AO = AUTO/OFF	LOS = LOCKOUT/STOP
AM = AUTO/MANUAL	LA = LOCAL/AUTO
CM = COMPUTER/MANUAL	LR = LOCAL/REMOTE
CL = COMPUTER LOCAL	OC = OPEN/CLOSE
ES = EMERGENCY STOP	OCA = OPEN/CLOSE/AUTO
FR = FORWARD/REVERSE	OO = ON/OFF
FOR = FORWARD/OFF/REVERSE	OOA = ON/OFF/AUTO
FS = FAST/SLOW	OSC = OPEN/STOP/CLOSE
FOS = FAST/OFF/SLOW	RES = RESET
HOA = HAND/OFF/AUTOMATIC	RSL = RAISE/STOP/LOWER
LLS = LEAD/LAG/STANDBY	SS = START/STOP
LO = LOCAL/OFF	SOR = START/OFF/RESET
LOC = LOCAL/OFF/COMPUTER	V/B = VFD/BYPASS
LOR = LOCAL/OFF/REMOTE	

PIPING LINE SYMBOLS

PRIMARY (AG & UG)

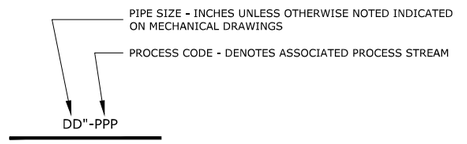
SECONDARY / UTILITY (AG & UG)

FUTURE OR EXISTING ON NEW P&IDs

JACKETED OR DOUBLE CONTAINMENT

NOT A PIPE

PIPELINE IDENTIFICATION DESCRIPTION



INSTRUMENT LINE SYMBOLS

INSTRUMENT SUPPLY OR CONNECTION TO PROCESS

PNEUMATIC SIGNAL

ELECTRIC SIGNAL (ANALOG)

ELECTRIC SIGNAL (DISCRETE)

HYDRAULIC SIGNAL

CAPILLARY TUBE

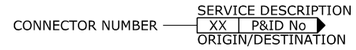
ELECTROMAGNETIC, SONIC, OPTICAL, OR NUCLEAR SIGNAL

SOFTWARE OR DATA LINK

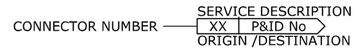
MECHANICAL LINK

OFF-PAGE CONNECTORS AND TIE-IN SYMBOL

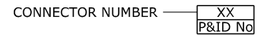
A. OFF-PLOT CONNECTOR



B. PRIMARY/SECONDARY LINES AND INSTRUMENT SIGNAL CONNECTOR



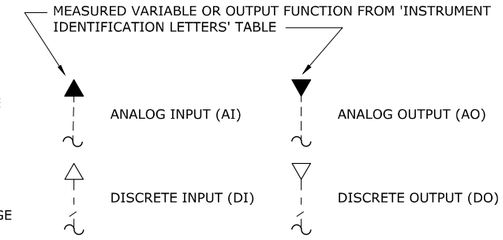
C. UTILITY CONNECTOR



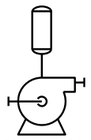
FLOW STREAM IDENTIFIERS

ATM = ATMOSPHERIC AIR	PI = PRIMARY INFLUENT
BS = BLENDED SLUDGE	POL = POLYMER
CAS = CAUSTIC SODA	PS = PRIMARY SLUDGE
DB = DIGESTER BYPASS	PSCM = PRIMARY SCUM
DE = DECANT	PT = PRESSATE
DG = DIGESTER GAS	PW = POTABLE WATER
DR = DRAIN	RAS = RETURN ACTIVATED SLUDGE
DS = DIGESTER SOLIDS	RD = RECYCLE/DRAIN
FA = FOUL AIR	RS = RAW SEWAGE
FBW = FILTER BACKWASH	SCRN = SCREENINGS
FE = FINAL EFFLUENT	SE = SECONDARY EFFLUENT
FT = FILTRATE	SSCM = SECONDARY SCUM
GR = GRIT	STM = STORM
HW = HOT WATER	TBS = THICKENED BLENDED SLUDGE
ML = MIXED LIQUOR	TE = TERTIARY EFFLUENT
OF = OVERFLOW	UW = UTILITY WATER
PA = PROCESS AIR	WAS = WASTE ACTIVATED SLUDGE
PE = PRIMARY EFFLUENT	

INPUT / OUTPUT SIGNALS



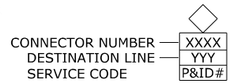
TYPICAL EQUIPMENT TAG NUMBERS & DESIGNATION



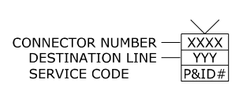
AER = AERATOR	FED = FEEDER
BIN = BIN	FLT = FILTER
BLO = BLOWER	HEX = HEAT EXCHANGER
CEL = CELL	MIX = MIXER
CLA = CLARIFIER	PMP = PUMP
CLS = CLASSIFIER	PRS = PRESS
CND = CONDENSATE TRAP	SCN = SCREEN
CON = CONVEYOR	SMP = SUMP
DIF = DIFFUSER	THK = THICKENER
DIG = DIGESTER	TNK = TANK
DIS = DISINFECTION UNIT	WEL = WET WELL

DRAIN CONNECTORS

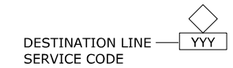
CLOSED DRAIN



OPEN DRAIN



CLOSED DRAIN (NO P&ID)



OPEN DRAIN (NO P&ID)



NO.	DATE	BY	REVISION

NOTICE

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MAHLER WRF
OWNER-PROVIDED
DEWATERING EQUIPMENT
PROCUREMENT

LEGEND, SYMBOLS AND ABBREVIATIONS 1

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: SEPTEMBER 2022

SHEET
I-001
- of ###

I-001 - P2.dwg I-001 12/6/2022 2:47 PM AARON

PRIMARY ELEMENT SYMBOLS

- XX — GENERAL SYMBOL IN-LINE ELEMENT XX = FS, FG, FE, FT
- FT, XXXX — IN-LINE FLOW ELEMENT WITH INTEGRAL TRANSMITTER XXXX = MASS, CORIOLIS, THERMAL, INT. ORIFICE ...
- FT / FE, XXXX — IN-LINE FLOW ELEMENT WITH SEPARATE TRANSMITTER XXXX = MASS, CORIOLIS, THERMAL...
- ORIFICE
- M — MAGNETIC
- TURBINE OR PROPELLER
- ULTRASONIC
- VORTEX
- PITOT TUBE
- AVERAGING PITOT TUBE
- FLOW NOZZLE
- VENTURI
- WEDGE METER
- LE — RADAR (NON-CONTACT)
- LE — ULTRASONIC LEVEL SENSOR
- LE — ULTRASONIC LEVEL SENSOR (GUIDED)
- LS* — FLOAT SWITCH
  FLOAT SWITCH
  * = L/LL/H/HH
- FS* — FLOW SWITCH
  * = H/L
- FG — FLOW GLASS
- FLOW CONDITIONING DEVICES (e.g., STRAIGHTENING VANES)
- FO — RESTRICTION ORIFICE
- AE X — ANALYZER ELEMENT
  X INDICATES TYPE
  pH = HYDROGEN POTENTIAL
  DO = DISSOLVED OXYGEN
  H2S = HYDROGEN SULFIDE
  LEL = LOWER EXPLOSIVE LIMIT
  O2 = OXYGEN
  ORP = OXYGEN REDUCTION POTENTIAL
- ROTAMETER
- FI — ROTAMETER WITH INTEGRAL VALVE (SHOWN WITH OPTIONAL INTEGRAL VALVE)
- FLUME
- WEIR
- POSITIVE DISPLACEMENT
- ORIFICE IN QUICK CHANGE FITTING
- TARGET

PROCESS EQUIPMENT

- HORIZONTAL CENTRIFUGAL PUMP
- VERTICAL INLINE PUMP
- SUBMERSIBLE PUMP
- PROPELLER PUMP
- PROGRESSIVE CAVITY PUMP
- MULTI-RAKE
- POSITIVE DISPLACEMENT PUMP
- LIQUID RING VACUUM PUMP
- VERTICAL CAN PUMP
- SCREW PUMP
- MANUAL BAR SCREEN
- SUBMERSIBLE MIXER
- POSITIVE DISPLACEMENT BLOWER
- CENTRIFUGAL BLOWER
- CENTRIFUGAL COMPRESSOR
- RECIPROCATING COMPRESSOR
- SCREW COMPRESSOR
- GRIT CHAMBER
- FLOCCULATION TANK
- AERATION DIFFUSER
- DOME ROOF TANK
- CLOSED TOP TANK
- OPEN TOP TANK / WET WELL/ CHANNEL
- CLARIFIER
- GRIT CLASSIFIER
- WASH PRESS
- CLOTH FILTER
- DRAFT TUBE PUMP
- SCREW CONVEYOR
- OUTFALL DIFFUSER
- ROTARY SCREEN THICKENER
- SPIRAL HEAT EXCHANGER
- SCREW PRESS

VALVE SYMBOLS (N.C. WHEN SHADED)

- GATE VALVE
- CHECK VALVE
- STOP CHECK VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- NEEDLE VALVE
- BALL VALVE
- BALANCING VALVE
- PLUG VALVE
- DIAPHRAGM VALVE
- 3-WAY VALVE
- 4-WAY VALVE
- PINCH VALVE
- ANGLE VALVE
- KNIFE VALVE
- SLUICE OR SLIDE GATE

PIPING FITTINGS

- FLANGE
- WELDED CONNECTION
- CAP
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- HOSE CONNECTION
- SPACER
- BLANK
- OPEN FIGURE 8 BLIND
- CLOSED FIGURE 8 BLIND
- PLUG
- BLIND FLANGE

PIPING SPECIALTY ITEMS

- Y-TYPE STRAINER
- CONE STRAINER
- T-TYPE STRAINER
- DUPLEX STRAINER
- BASKET STRAINER
- TEMPORARY STRAINER
- FILTER
- DETONATION ARRESTOR (D)
- FLAME ARRESTOR (F)
- STEAM TRAP (T)
- EXHAUST HEAD
- IN-LINE SILENCER (S)
- VENT SILENCER (S)
- MECHANICAL COUPLING
- EJECTOR
- REMOVABLE SPOOL (RS)
- DESUPERHEATER (DS)
- FLEXIBLE HOSE
- EXPANSION JOINT
- DAMPER
- BREATHER
- VENT COVER
- IN-LINE MIXER
- DIVERTER VALVE
- ROTARY VALVE
- EXCESS FLOW VALVE
- PULSATION DAMPENER
- PI — PRESSURE INDICATOR

CONTROL VALVE ACTUATOR SYMBOLS

- MANUAL OPERATOR
- DIAPHRAGM
- PRESSURE BALANCED DIAPHRAGM
- HANDWHEEL WITH ACTUATOR
- CYLINDER - PISTON
- M — MOTOR OPERATED - CONSTANT SPEED
- E/H — ELECTRO-HYDRAULIC
- S — SINGLE SOLENOID
- S, R — SINGLE SOLENOID - MANUAL RESET
- S, R — SINGLE SOLENOID - REMOTE RESET

MISCELLANEOUS INSTRUMENT SYMBOLS

- CHEMICAL SEAL- DIAPHRAGM
- ANNULAR SEAL
- PILOT LIGHT OR GAUGE GLASS ILLUMINATOR
  X INDICATES COLOR
  R = RED B = BLUE G = GREEN
  A = AMBER W = WHITE
- DUAL FUNCTION OR INSTRUMENTS SHARING COMMON HOUSING
- I — UNDEFINED INTERLOCK LOGIC

SELF-ACTUATED DEVICES

- RUPTURE DISC - PRESSURE RELIEF SAFETY HEAD FOR PRESSURE RELIEF (EXPLOSION PANEL)
- RUPTURE DISC - VACUUM RELIEF SAFETY HEAD FOR VACUUM RELIEF (EXPLOSION PANEL)
- PRESSURE RELIEF - SAFETY VALVE
- VACUUM RELIEF VALVE
- PRESSURE AND VACUUM RELIEF VALVE CONSERVATION VENT
- P — PILOT OPERATED RELIEF VALVE WITH REMOTE SENSOR (USE APPROPRIATE RELIEF VALVE SYMBOL)
- PRESSURE REDUCING REGULATOR (SELF-CONTAINED)
- BACK PRESSURE REGULATOR (SELF-CONTAINED)
- BACK PRESSURE REGULATOR W/ EXTERNAL TAP
- PRESSURE REDUCING REGULATOR W/ EXTERNAL TAP
- DIFFERENTIAL PRESSURE REDUCING REGULATOR
- TEMPERATURE REGULATOR FILLED SYSTEM TYPE

NO.	DATE	BY	REVISION

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MAHLER WRF
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

LEGENDS, SYMBOLS AND ABBREVIATIONS 2

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: SEPTEMBER 2022

SHEET
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I-002 - P2.dwg I-002 12/6/2022 2:52 PM AARON

SCADA

PLC

FLOW FY 250-21

FLOW RATE FI 250-00 | FLOW PACE FQ 250-00 | READY YI 250-01A | RUN'G YI 250-01B | IN REMOTE HS 250-01 | FAULT XA 250-01 | START CMD YC 250-01 | SPEED FDBK SI 250-01 | SPEED CTRL SC 250-01 | HI LEVEL LSH 250-01

READY YI 250-02A | RUN'G YI 250-02B | IN REMOTE HS 250-02 | FAULT XA 250-02 | START CMD YC 250-02 | SPEED FDBK SI 250-02 | SPEED CTRL SC 250-02 | LEVEL LI 250-02

E/I/P

VFD-250-01: FAULT YA 250-01 A | CTRL POWER YL 250-01B W | RUN'G YL 250-01A R | RESET HS 250-01A

VFD-250-01: FAULT YA 250-02 A | CTRL POWER YL 250-02B W | RUN'G YL 250-02A R | RESET HS 250-02A

LCS-250-01

LOR HS 250-01 | FAST STOP PB 250-01A | FAULT YA 250-01A A

SPEED HS 250-01B | START PB 250-01B | STOP PB 250-01C | RUN YA 250-01B R

LOR HS 250-02 | FAST STOP PB 250-02A | FAULT YA 250-02A A

SPEED HS 250-02B | START PB 250-02B | STOP PB 250-02C | RUN YA 250-02B R

POL D I-253 FROM POLYMER MAKEDOWN — POL

LSH 250-01

FIT 250-00

FE 250-00

6"

DS . I-640 FROM SLUDGE BLEND TANK — 4"-DS

4"x6"

M

4"

MIX-250-01
CONDITIONING TANK MIXER

LE 250-02 | LIT 250-02

DEWATERING EQUIPMENT VENDOR PACKAGE

DEW-250-02
DEWATERING SCREW PRESS

FS 250-21

UW . . FROM UTILITY WATER LOOP — 2"-UW

24 VDC

2"-UW

CV-250-11

2"-UW

2"-UW

2"-UW

FS 250-22

24 VDC

2"-UW

CV-250-12

2"-UW

1 1/2"-UW

2"-UW

FS 250-23

24 VDC

2"-UW

CV-250-13

2"-UW

1 1/2"-UW

VENDOR FURNISHED PACKAGE SYSTEM

CHUTE

A I-252 DEWATERING CAKE CONVEYOR

6"-DR

CLEAN OUT

6"-DR

DR B I-252 TO RDPS

I-251.dwg I-251 12/15/2022 8:56 AM AARON

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MAHLER WATER RECLAMATION FACILITY IMPROVEMENT PROJECT

SOLIDS DEWATERING 1

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: SEPTEMBER 2022

SHEET I-251 - of ###

SCADA

PLC

ZERO SPEED SIL 250-03 | PULL CORD HS 250-03 | RUN'G YI 250-03 | IN REMOTE HS 250-03 | FAULT XA 250-03 | START CMD YC 250-03

ZERO SPEED SIL 250-04 | PULL CORD HS 250-04 | RUN'G YI 250-04 | IN REMOTE HS 250-04 | FAULT XA 250-04 | START CMD YC 250-04

ZERO SPEED SIL 250-05 | PULL CORD HS 250-05 | RUN'G YI 250-05 | IN REMOTE HS 250-05 | FAULT XA 250-05 | START CMD YC 250-05

DEWATERING EQUIPMENT VENDOR PACKAGE

MS-250-03
- FAULT YA 250-03 A
- RUN'G YL 250-03A R
- CTRL POWER YL 250-03B W

LCS-250-01
- LOR HS 250-03
- FAST STOP PB 250-03A
- RUN'G YL 250-03A R
- START PB 250-03B
- STOP PB 250-03C
- FAULT YA 250-03B A

MS-250-04
- FAULT YA 250-04 A
- RUN'G YL 250-04A R
- CTRL POWER YL 250-04B W

LCS-250-02
- LOR HS 250-04
- FAST STOP PB 250-04A
- RUN'G YL 250-04A R
- START HS 250-04B
- STOP PB 250-04C
- FAULT YA 250-04B A

MS-250-05
- FAULT YA 250-05 A
- RUN'G YL 250-05A R
- CTRL POWER YL 250-05B W

LCS-250-02
- LOR HS 250-05
- FAST STOP PB 250-05A
- RUN'G YL 250-05A R
- START HS 250-05B
- STOP PB 250-05C
- FAULT YA 250-05B A

A I-251 — DEWATERING SCREW PRESS

CHUTE

ES
HS 250-03
SSL 250-03
CV 250-41

CON-250-03
DEWATERING CAKE CONVEYOR

X"-DR

SSL 250-04
ES
HS 250-04

CON-250-04
HORIZONTAL CONVEYOR

DUMPSTER 2

H-250-06
LIDDING SYSTEM HOIST

SSL 250-05
ES
HS 250-05

CON-250-05
LIDDING SYSTEM CONVEYOR

DUMPSTER 1

DR B I-251 — FROM SOLIDS DEWATERIN 1

10"-DR

DR . I-130 — TO DRAIN

NO.	DATE	BY	REVISION

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MAHLER WATER RECLAMATION FACILITY IMPROVEMENT PROJECT

SOLIDS DEWATERING 2

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: SEPTEMBER 2022

SHEET
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I-252.dwg I-252 12/15/2022 9:16 AM AARON

SCADA

PLC

FLOW FAULT XA 250-04
RUN'G YI 250-04
REMOTE HS 250-04
SPEED CTRL SC 250-04
REMOTE START YC 250-04

SHOWER IN-USE ALARM FS 250-00

HTR-250-09
TANKLESS WATER HEATER

FSH 250-09

AV

EYS-250-09
EYE WASH/SHOWER

PW
D I-530
FROM POTABLE WATER CONNECTION

1"-PW

PI 250-6A

1"-PW

LCS-250-06
LOR HS 250-04
START PB 250-04
STOP PB 250-04
SPEED HS 250-04
POWER ON YA 250-04
RUN YA 250-04
FAULT YA 250-04
FAST STOP PB 250-04

DEWATERIN EQUIPMENT VENDOR PACKAGE

SV 250-06 UW
FSL 250-06A
FI 250-06A
FI 250-06B

PI 250-06B
PI 250-06
FSL 250-06B
MIX-250-07
MIXER

POL

TNK-250-06
MIXING CHAMBER

POLYMER STORAGE
TOTE

FEED PUMP

POL-250-06
POLYMER MAKEDOWN SYSTEM

POL
D I-251
TO SOLIDS DEWATERING

I-253.dwg I-253 12/6/2022 3:00 PM AARON

NO.	DATE	BY	REVISION

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MAHLER WATER RECLAMATION FACILITY IMPROVEMENT PROJECT

POLYMER MAKEDOWN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: SEPTEMBER 2022

SHEET
I-253
- of ###

Mahler Water Reclamation Facility (MWRF) Interim Improvements

ADDENDUM NO. 2

FOR

OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT

To: All Prospective Bidders

The following clarifications, changes, additions and/or deletions are hereby made a part of the Contract Documents issued for the above referenced project as fully and completely as if the same were fully set forth therein.

This Addendum consists of 1 page, including this cover page.

BIDDER QUESTIONS

Q1. Is prequalification necessary to bid on this project?
A1. No, prequalification is not necessary for this project.

Q2. Does the dewatering equipment need to be offloaded and moved to a resting position or installed as shown on the drawings?
A2. The dewatering equipment shall be delivered to the site and offloaded to a resting position at a designated area at the plant. The equipment does not need to be installed as shown on the drawings.

End of Addendum No. 2

Mr. Greg Springman, Public Works Director

January 09, 2023
Date

SECTION 00 40 00 - BID FORM
(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON

THIS BID IS SUBMITTED TO: City of Sweet Home

Attn: Greg Springman, Public Works Director
3225 Main Street
Sweet Home, OR 97386

1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2.01 Bidder accepts all of the terms and conditions of the Advertisement for Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.

2.02 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 13.05 of the General Conditions on or before the **dates or within the number of calendar days indicated in the Agreement.**

2.03 Bidder agrees to complete the Work required to complete the Milestones in accordance with Article 2 of the Agreement by the dates provided in Article 2.02.

2.04 Bidder accepts the provisions of the Agreement as to liquidated damages as stipulated in Article 2.04 of the Agreement and in the General Conditions.

3.01 Refer to the Instructions to Bidders for forms and documents that must be executed in full and submitted with the bid.

3.02 The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, and the General Conditions.

3.03 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data and documents identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

Addendum No.	Addendum Date
1	December 20, 2022

B. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

C. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

D. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.

E. Bidder has correlated the information known to Bidder, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

F. Bidder has given OWNER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by OWNER is acceptable to Bidder.

G. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.01 Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the price described in the following bid schedule within the time of completion specified in the Agreement.

BID SCHEDULE

Bidder shall submit a Bid as set forth in the Bid form. Submission of Bids on this schedule signifies Bidder's willingness to enter into a Contract for the price offered. Bidders offering a Bid on this schedule must be capable of completing the Work within the time period stated in the Agreement. OWNER may elect to any delete bid item from the work.

1.01 LUMP SUM WORK

A. Bidder proposes and agrees to accept as full payment the following bid amount for the Mahler WRF Owner-Provided Dewatering Equipment Procurement proposed within the Bidding Documents, and certifies that this amount is based upon the undersigned's own estimate of quantities and costs and includes sales, consumer, use, and other taxes, except as provided below, overhead and profit.

B. Lump Sum Bid Price: $ 598,815 ^00

Bidder Identification and Signatures

Name of Firm: FKC Co., Ltd.

Federal Tax ID No: 91-1415986

State of Incorporation and Oregon CCB License No: Washington State, CCB License N/A

Bidder ☐ IS / ☒ IS NOT a "Resident Bidder" as defined by ORS 279.029.

Signature and Printed Name(s): *(If Bidder is a partnership or joint venture, all parties must sign below)*

Trent Bohman

Title Vice President

Date 5 JAN 2023

END OF SECTION

CONSENT TO ACTION OF BOARD OF DIRECTORS
IN LIEU OF ANNUAL MEETING
OF
FKC CO., LTD.

The undersigned, being the sole director of this corporation, acting pursuant to RCW 23B.08.210 without the necessity of a formal meeting, hereby adopts the following resolutions and hereby consents to the taking of the actions herein set forth:

RESOLVED, that the following persons are hereby elected officers of the corporation, in the following capacities, to serve until the next annual meeting of the Board of Directors, and until their successors are elected and qualified:

President	Roger Olson
Sr. Vice-President	James Capell
Vice-President	Trent Bohman
Secretary	Lisa Webb

AND, RESOLVED that FKC Co., Ltd. is accumulating earnings to have adequate reserves to fund future growth in sales and construction projects. In addition, due to the standard contractual agreements regarding payment for major equipment provided by FKC Co., Ltd, it is critical to maintain a substantial amount of cash in the business checking account, in order to purchase raw materials and component parts for projects that do not require payment from the buyer to the seller (FKC), until the goods are delivered and started up.

FURTHER RESOLVED, that all of the acts of the officers of the corporation, from the date of the last annual meeting of the Board of Directors through the date hereof, which are, lawful, and which have been disclosed to the director, are hereby approved, ratified and confirmed.

Dated effective March 21, 2022

Tomo Ogawa

ARTICLE 1— BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name: FKC Co., LTD Address *(principal place of business)*: 2708 W 18th St. Port Angeles, WA 98363	Name: Travelers Casualty & Surety Company of America Address *(principal place of business)*: 1501 Fourth Ave. Ste. 1000 Seattle, WA 98101
Owner	**Bid**
Name: City of Sweet Home, Oregon Address *(principal place of business)*: 3225 Main Street Sweet Home, OR 97386	Project *(name and location)*: Mahler WRF Owner-Provided Dewatering Equipment Procurement 1357 Pleasant Valley Road Sweet Home, OR 97386 Bid Due Date: January 10, 2023
Bond	
Penal Sum: Five Percent of Total Bid (5%) Date of Bond: January 5, 2023	

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	Surety
FKC Co., LTD *(Full formal name of Bidder)*	Travelers Casualty & Surety Company of America *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: Trent Bohman *(Printed or typed)*	Name: Cathy L Wahlsten *(Printed or typed)*
Title: Vice President	Title: Attorney-in-fact
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: Lisa J. Webb *(Printed or typed)*	Name: Tracy L Pitz *(Printed or typed)*
Title: Witness	Title: Witness

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

EJCDC® C-430, Bid Bond (Penal Sum Form).
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1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
    3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
    3.2. All Bids are rejected by Owner, or
    3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

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TRAVELERS

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Cathy L. Wahlsten** of **Port Angeles** **Washington**, their true and lawful Attorney-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **3rd** day of **February, 2017.**

State of Connecticut

City of Hartford ss.

By: _____
Robert L. Raney, Senior Vice President

On this the **3rd** day of **February, 2017**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June, 2021**

Marie C. Tetreault
Marie C. Tetreault, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this **5th** day of **January**, **2023**

Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney-in-Fact and the details of the bond to which the power is attached.

SECTION 00 45 19 – NON-COLLUSION AFFIDAVIT

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON

STATE OF OREGON
COUNTY OF LINN

I state that I am Vice President (title) of FKC Co., Ltd. (name of firm) and that I am authorized to make this affidavit on behalf of my firm and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder, except as disclosed on the attached appendix.

(2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

(5) FKC Co., Ltd. (name of firm), its affiliates, subsidiaries, officers, directors and employees are not currently under investigation by any governmental agency for violating any non-collusion statutes and have not in the last four years been convicted of or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described in the attached appendix.

I state that FKC Co., Ltd. (name of firm) understands and acknowledges that the above representations are material and important and will be relied on by the City of Sweet Home in awarding the contract(s) for which this bid is submitted. I understand, and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the City of Sweet Home of the true facts relating to the submission of bids for this contract.

Authorized Signature

FKC Co., Ltd. / Vice President
Name of Company / Position

LISA J WEBB NOTARY PUBLIC STATE OF WASHINGTON My Comm. Expires February 13, 2026 No. 170540

Sworn to and subscribed before me this 5 day of January, 2023.

Notary Public for the State of Washington

2-13-26
My Commission Expires

SECTION 00 43 33- PROPOSED PRODUCTS LIST

(To be submitted with Bid)

MAHLER WATER RECLAMATION FACILITY INTERIM IMPROVEMENTS
OWNER-PROVIDED DEWATERING EQUIPMENT PROCUREMENT
CITY OF SWEET HOME, OREGON

The Bidder states that the manufacturer of each listed item of equipment or material proposed by the Contractor for use on this Project will be as listed below:

Material Item	Description	Equipment or Material Manufacturer (Do not show Dealer or Supplier)
1	Screw Press Dewatering Equipment (46 76 27)	FKC Co., Ltd.
2	Shaftless Screw Conveyors (41 12 13)	FKC Co, Ltd.
3	Polymer Blending Unit (46 33 33)	Velodyne

The Bidder must include in the space provided, the name of the equipment or material manufacturer he has used in determining his Base Bid which will be used by the Successful Bidder in constructing the project. If the Bidder does not fill in any of the spaces, it will be considered that the Bidder has selected the first-named manufacturer as his selection for those spaces not filled in.

After the opening of Bids, no changes or substitutions from those listed manufacturers will be allowed without the express written approval of the Engineer. If such change is permitted by the Engineer, it will be evaluated in accordance with provisions of the Contract Documents pertaining to Specified Items/Proposed Equivalents.

Circumstances which will justify changes to the above listing are limited to the following:

1. Manufacturer is unable to meet specifications.
2. Manufacturer fails to honor original quotation upon which the Contractor's bid was based.
3. Manufacturer goes out of business or ceases to make the specified product.

It is the responsibility of the Contractor to furnish materials and equipment meeting the requirements of the Specifications, and acceptance of the bid does not constitute nor imply favorable review or approval of items proposed. The Owner reserves the right to deny approval or acceptance of any equipment or materials which do not comply with Specifications even though listed herein.


(Signature)

Trent Bohman
(Type or Print Name)

Vice President
(Title)

FKC Co., Ltd.
(Company)

END OF SECTION

FKC CO., LTD.

2708 West 18th Street
Port Angeles, WA 98363

(360) 452-9472
FAX (360) 452-6880

January 5, 2023

RE: Authority for FKC Co., Ltd. to Supply Equipment for Projects in Oregon

I hereby certify that FKC Co., Ltd. based in Port Angeles WA has legal authority to design, fabricate, and supply equipment for municipal projects in the State of Oregon.

See attached Washington State business license for FKC Co., Ltd.

FKC's Federal Tax ID number is: 91-1415986

Best regards,

Roger Olson
President
FKC Co., Ltd.
2708 W. 18th St.
Port Angeles, WA 98363
Office: (360) 452-9472 x 102
rjolson@fkcscrewpress.com

BUSINESS LICENSE

STATE OF WASHINGTON

Issue Date: Aug 27, 2021

Profit Corporation

Unified Business ID #: 601083995
Business ID #: 001
Location: 0001

FKC CO., LTD.
2708 W. 18TH ST.
PORT ANGELES WA 98363

UNEMPLOYMENT INSURANCE - ACTIVE

INDUSTRIAL INSURANCE - ACTIVE

TAX REGISTRATION - ACTIVE

LICENSING RESTRICTIONS:

Not licensed to hire minors without a Minor Work Permit.

This document lists the registrations, endorsements, and licenses authorized for the business named above. By accepting this document, the licensee certifies the information on the application was complete, true, and accurate to the best of his or her knowledge, and that business will be conducted in compliance with all applicable Washington state, county, and city regulations.

Vikki Smith

Director, Department of Revenue

STATE OF WASHINGTON

UBI: 601083995 001 0001

FKC CO., LTD.
2708 W. 18TH ST.
PORT ANGELES WA 98363

UNEMPLOYMENT INSURANCE - ACTIVE
INDUSTRIAL INSURANCE - ACTIVE
TAX REGISTRATION - ACTIVE

Vikki Smith

IMPORTANT!

PLEASE READ THE FOLLOWING INFORMATION CAREFULLY BEFORE POSTING THIS LICENSE

General Information

Post this Business License in a visible location at your place of business.

If you were issued a Business License previously, **destroy the old one and post this one in its place.**

Login to My DOR at dor.wa.gov if you need to make changes to your business name, location, mailing address, telephone number, or business ownership.

Telephone: 360-705-6741

Endorsements

All endorsements should be renewed by the expiration date that appears on the front of this license to avoid any late fees.

If there is no expiration date, the endorsements remain active as long as you continue required reporting. Tax Registration, Unemployment Insurance, and Industrial Insurance endorsements require you to submit periodic reports. Each agency will send you the necessary reporting forms and instructions.

For assistance or to request this document in an alternate format, visit http://business.wa.gov/BLS or call (360) 705-6741. Teletype (TTY) users may use the Washington Relay Service by calling 711.

WASHINGTON
Secretary of State
Corporations & Charities Division

Filed
Secretary of State
State of Washington
Date Filed: 04/22/2022
Effective Date: 04/22/2022
UBI #: 601 083 995

EXPRESS ANNUAL REPORT WITH CHANGES

BUSINESS INFORMATION

Business Name:
FKC CO., LTD.

UBI Number:
601 083 995

Business Type:
WA PROFIT CORPORATION

Business Status:
ACTIVE

Principal Office Street Address:
2708 W. 18TH ST., PORT ANGELES, WA, 98363, UNITED STATES

Principal Office Mailing Address:
2708 W 18TH ST, PORT ANGELES, WA, 98363-1349, UNITED STATES

Expiration Date:
05/31/2023

Jurisdiction:
UNITED STATES, WASHINGTON

Formation/Registration Date:
05/05/1988

Period of Duration:
PERPETUAL

Inactive Date:

Nature of Business:
MANUFACTURER OF INDUSTRIAL DEWATERING EQUIPMENT

REGISTERED AGENT RCW 23.95.410

Registered Agent Name	Street Address	Mailing Address
ROGER OLSON	2708 W 18TH ST, PORT ANGELES, WA, 98363-0000, UNITED STATES	

PRINCIPAL OFFICE

Phone:
3604529472

Email:
LWEBB@FKCSCREWPRESS.COM

Street Address:

2708 W. 18TH ST., PORT ANGELES, WA, 98363, USA

Mailing Address:
2708 W 18TH ST, PORT ANGELES, WA, 98363-1349, USA

GOVERNORS

Title	Type	Entity Name	First Name	Last Name
GOVERNOR	INDIVIDUAL		ROGER	OLSON
GOVERNOR	INDIVIDUAL		LISA	WEBB
GOVERNOR	INDIVIDUAL		JAMES	CAPELL
GOVERNOR	INDIVIDUAL		RICHARD	BOHMAN

NATURE OF BUSINESS

- MANUFACTURER OF INDUSTRIAL DEWATERING EQUIPMENT

EFFECTIVE DATE

Effective Date:
04/22/2022

CONTROLLING INTEREST

1. Does this entity own (hold title) real property in Washington, such as land or buildings, including leasehold improvements?
NO
2. In the **past 12 months**, has there been a transfer of at least 16-2/3 percent of the ownership, stock, or other financial interest in the entity?
NO
a. If "Yes", in the **past 36 months**, has there been a transfer of controlling interest (50 percent or greater) of the ownership, stock, or other financial interest in the entity?
NO
3. If you answered "Yes" to question 2a, has a controlling interest transfer return been filed with the Department of Revenue?
NO

You **must** submit a Controlling Interest Transfer Return form if you answered "yes" to questions 1 **and** 2a.

Failure to report a Controlling Interest Transfer is subject to penalty provisions of RCW 82.45.220.

For more information on **Controlling Interest**, visit www.dor.wa.gov/REET.

RETURN ADDRESS FOR THIS FILING

Attention:
Email:
Address:
2708 W 18TH ST, PORT ANGELES, WA, 98363, USA

EMAIL OPT-IN

☐ By checking this box, I hereby opt into receiving all notifications from the Secretary of State for this entity via email only. I acknowledge that I will no longer receive paper notifications.

FKC CO., LTD.
2708 West 18th Street
Port Angeles, WA 98363
(360) 452-9472
FAX (360) 452-6880

A. Proposed Equipment

1. Screw Press

Quantity	Description	Unit Price FOB Sweet Home, OR
1	FKC Screw Press Model BHX 800x4500L	**See Bid Form**

Material to process: Municipal Waste Activated Sludge (WAS) or Municipal Anaerobically Digested Sludge (ADS)

Inlet Consistency:
WAS 0.5 to 2.0% % Total Solids
ADS 1.0 to 2.5% Total Solids

Inlet Hydraulics:

Anaerobicaly Digested Sludge

gpm	%TS	dry #/hr
92	1.0%	458
83	1.1%	458
76	1.2%	458
70	1.3%	458
65	1.4%	458
61	1.5%	458
57	1.6%	458
54	1.7%	458
51	1.8%	458
48	1.9%	458
46	2.0%	458
44	2.1%	458
42	2.2%	458
40	2.3%	458
38	2.4%	458
37	2.5%	458

Waste Activated Sludge

gpm	%TS	dry #/hr
100	0.5%	250
100	0.6%	300
100	0.7%	350
94	0.8%	375
83	0.9%	375
75	1.0%	375
68	1.1%	375
62	1.2%	375
58	1.3%	375
54	1.4%	375
50	1.5%	375
47	1.6%	375
44	1.7%	375
42	1.8%	375
39	1.9%	375
37	2.0%	375

Average Solids Thru put:
WAS 375 dry pounds per hour, 4.5 BDST/d
ADS 458 dry pounds per hour, 5.5 BDST/d

Min Outlet Consistency:
WAS 15% Total Solids
ADS 18% Total Solids

Max Polymer Consumption:
WAS 30 active lbs per dry ton solids
ADS 35 active lbs per dry ton solids

Solids Capture Rate: 95% (minimum) or 750 mg/L TSS maximum

A. Proposed Equipment

1. Screw Press (con't)

Quantity	Description	Unit Price FOB Sweet Home, OR
(con't – FKC Screw Press Model BHX-800x4500L)		**Included**

Materials of Construction:

Screw Shell	304 Stainless Steel
Screw Flight	304 Stainless Steel
Drums	304 Stainless Steel
Screens	304 Stainless Steel
Discharge Box	304 Stainless Steel
Inlet Stand	304 Stainless Steel
Bearing Housings & Gussets	Painted Carbon Steel
Base	304 Stainless Steel
Covers	304 Stainless Steel
Fasteners (B,N,W,Clips) in wetted area	304 Stainless Steel
Shaft Seals	Nitrile Rubber

Including:

Marine Grade Aluminum Skid
with Access Ladder to FT
with Screw Press support legs
Flocculation Tank (FT)
model 175GL, 304SS body, 1 HP motor
Velodyne Polymer Blending Unit
model VM-5P-1200-D-0-A-1
FKC Standard Control Panel
NEMA 4X, 304SS, w/PLC & HMI

Including Other:

1 set standard tools in toolbox
1 set drum covers
1 motor coupling

Speed Reducer: Sumitomo Cyclo Reducer

Motor: 2 HP, 460V, 3ph, 145TC Frame

A. Proposed Equipment

2a. Shaftless Screw Conveyors

Quantity	Description	Unit Price FOB Sweet Home, OR
1	Shaftless Screw Conveyor Approximately 22'-5" long 3 HP, 460V, 3ph, 1800 rpm motor To include: Reducers: SEW Eurodrive, Type FAZ, Parallel Shaft Helical Gearmotor Spiral Flighting: Diameter of 9-inch minimum, 0.75-inch x 2-1/2 inch spiral. Spring effect at full load will not elongate more than .08" per foot of length. 8620 steel material. Drive end of flighting to include shop installed torque plate for bolting to drive shaft. Shop/field full penetration welds at all splice connections. Troughs: 10-gauge, 304 stainless steel formed flange u-troughs fabricated in maximum 8' lengths. Trough end plates will be minimum 3/8" thick 304 stainless steel. The screw conveyor trough will be provided with two 2-inch threaded out at each, the discharge end will be capped, and the inlet end will connect to the drain. Trough Liners: 1/2" thick UHMW trough liner in 4' long sections. Liners held in place with 304 stainless steel 1/2" square bar retaining rods. Covers: 10-gauge 304 stainless steel formed conveyor covers in maximum 48" lengths. Covers will be gasketed and bolted to trough flange. Inlet Chutes: Fabricated from 10-gauge, 304 stainless steel with inlet to match the Screw Press or other conveyor outlets and the slope of the conveyor (if applicable). Conveyor Supports: 3"x3"x1/4" 304 stainless steel angle as required. Include anchor bolt calculations by Structural PE. Anchor bolts sized by FKC but supplied by Purchaser.	**See Bid Form**

A. Proposed Equipment

2a. Shaftless Screw Conveyors

Quantity	Description	Unit Price FOB Sweet Home, OR
(Shaftless Screw Conveyors – con't)		Included

Safety Stop Switch: NEMA 4x, 120vac safety stop switch with orange vinyl coated aircraft cable with stainless steel eyebolt supports and cable clips

Zero speed Switch: Milltronics MFA-4 and MSP-12 120 vac motion switch with NEMA 4X enclosure and 0-60 second time delay, single pole, double throw with cable and reset, 5amps, 120VAC, with actuator arm of 316SS.

Slide Gate Valves: None.

Spare Parts: None.

Assembly: Conveyor supports, safety stop switches, zero speed switches, gates, discharge chutes, and assembly bolts shipped loose for field installation by contractor.

Note: For inclined conveyor, only the A-frame style support legs closest to the inlet chute of the conveyor are supplied by FKC. All other support structures for the conveyor, including hangers for the discharge end gearmotor, are supplied by others.

A. Proposed Equipment

2b. Shaftless Screw Conveyors

Quantity	Description	Unit Price FOB Sweet Home, OR
1	Shaftless Screw Conveyor Approximately 9'-4" long 3 HP, 460V, 3ph, 1800 rpm motor To include: Reducers: SEW Eurodrive, Type FAZ, Parallel Shaft Helical Gearmotor Spiral Flighting: Diameter of 9-inch minimum, 0.75-inch x 2-1/2 inch spiral. Spring effect at full load will not elongate more than .08" per foot of length. 8620 steel material. Drive end of flighting to include shop installed torque plate for bolting to drive shaft. Shop/field full penetration welds at all splice connections. Troughs: 10-gauge, 304 stainless steel formed flange u-troughs fabricated in maximum 8' lengths. Trough end plates will be minimum 3/8" thick 304 stainless steel. The screw conveyor trough will be provided with two 2-inch threaded out at each, the discharge end will be capped, and the inlet end will connect to the drain. Trough Liners: 1/2" thick UHMW trough liner in 4' long sections. Liners held in place with 304 stainless steel 1/2" square bar retaining rods. Covers: 10-gauge 304 stainless steel formed conveyor covers in maximum 48" lengths. Covers will be gasketed and bolted to trough flange. Inlet Chutes: Fabricated from 10-gauge, 304 stainless steel with inlet to match the Screw Press or other conveyor outlets and the slope of the conveyor (if applicable). Conveyor Supports: 3"x3"x1/4" 304 stainless steel angle as required. Include anchor bolt calculations by Structural PE. Anchor bolts sized by FKC but supplied by Purchaser.	**See Bid Form**

A. Proposed Equipment

2b. Shaftless Screw Conveyors

Quantity	Description	Unit Price FOB Sweet Home, OR
(Shaftless Screw Conveyors – con't)		Included

Safety Stop Switch: NEMA 4x, 120vac safety stop switch with orange vinyl coated aircraft cable with stainless steel eyebolt supports and cable clips

Zero speed Switch: Milltronics MFA-4 and MSP-12 120 vac motion switch with NEMA 4X enclosure and 0-60 second time delay, single pole, double throw with cable and reset, 5amps, 120VAC, with actuator arm of 316SS.

Slide Gate Valves: None.

Spare Parts: None.

Assembly: Conveyor supports, safety stop switches, zero speed switches, gates, discharge chutes, and assembly bolts shipped loose for field installation by contractor.

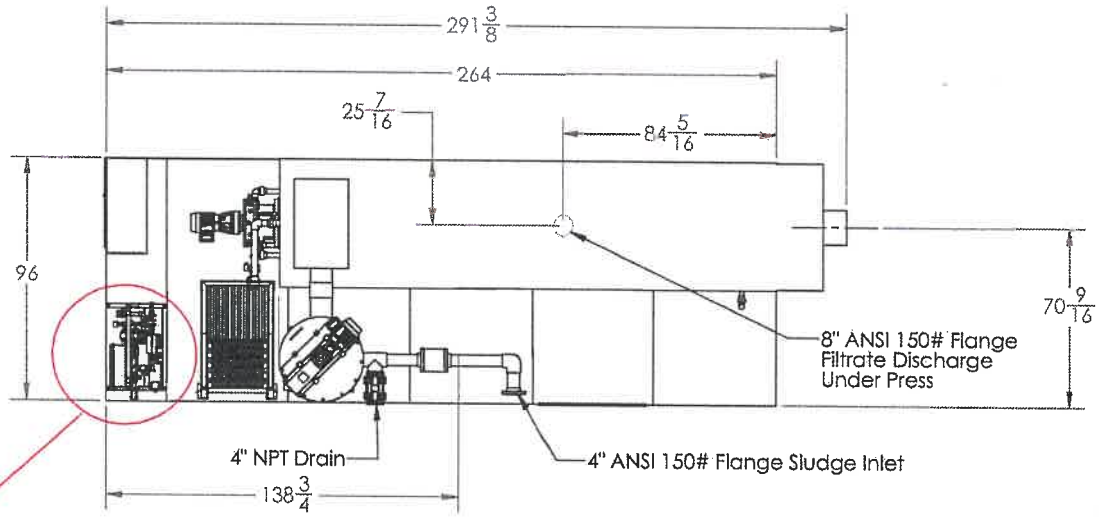
Note: For horizontal conveyor, all support structures for the conveyor, including legs, frames, and hangers are supplied by others. FKC scope and supply does not include any supports, legs, frames or hangers for the horizontal conveyor.

B. Notes, Clarifications and Exceptions

1. FKC understands that the delivery time is the important factor in bid and FKC scope of supply. Exceptions to the specifications have been provided with this important factor in mind. FKC has attempted to provide the desired materials and labor specified, but certain exceptions and clarifications have been made to meet your required delivery time.
2. It is expected that the FKC notes, clarifications, and exceptions will be added to the Procurement Task Order Documents list in the signed Agreement and be in full force for the project.
3. The screw press dewatering equipment, shaftless screw conveyors, polymer blending unit, panel mounted equipment specifications and P&IDs have been check marked by FKC. A checkmark signifies FKC compliance with the specification. A hashtag with a number (Example: #1) shows an FKC clarification or exception with description provided. FKC scope and pricing includes these notes on the check marked specifications provided.
4. In addition to the markups of the specifications, FKC offers the following notes, clarifications and exceptions:
    a. Taxes are not included in the FKC pricing offered. FKC does not collect or pay taxes in the State of Oregon. Any required taxes will be paid by the Owner directly to the applicable government agencies.
    b. FKC takes an exception to the Commercial General Liability insurance requirement of $2,000,000 each occurrence. Liberty Mutual, our insurance provider, provides $1,000,000 each occurrence. FKC also takes exception to the Automobile Liability insurance requirement of $2,000,000 combined single limit property damage. Liberty Mutual provides $1,000,000 combined single limit property damage.
    c. FKC will provide additionally insured forms CG 20 37 04 13 and CG 20 10 04 13.
    d. Examples of the warranties to be provided by FKC are provided with the bid bond. The 10-year warranty is only an Extended Mechanical Warranty for the screw press. See provided warranty examples for details.
    e. All anchor bolts for the FKC supplied equipment will be sized by FKC. FKC will provided anchor bolt design calculations by a Structural PE Engineer in the State of Oregon. All anchor bolts will be provided by others.
    f. No expansion joints (46 05 14-3.01.A) are provided in the FKC scope of supply or pricing.
    g. No copy or license of AB Rx Software, or any licensed software, is provided in the FKC scope of supply or pricing.
    h. The screw press legs on the skid are made of the same material as the skid, namely marine grade aluminum.
    i. For inclined conveyor, only the A-frame style support legs closest to the inlet chute of the conveyor are supplied by FKC. All other support structures for the conveyor, including hangers for the discharge end gearmotor, are supplied by others.
    j. For horizontal conveyor, all support structures for the conveyor, including legs, frames, and hangers are supplied by others. FKC scope and supply does not include any supports, legs, frames or hangers for the horizontal conveyor.
    k. The polymer blending unit will come with Velodyne standard motors. The screw press, flocculation tank and conveyor(s) motors, due to delivery time constraints, will not be provided with Thermal Protection or Grounding Units. FKC scope of supply and pricing includes Toshiba 841 XT C-face motors for the screw press, flocculation tank and conveyors. In leu of the Thermal Protection and Grounding Units, FKC has provided a total of Qty (4) additional Toshiba motors as spares for the screw press, flocculation tank and conveyor motors.

Note:

- Equipment Weight: 15,000
- Operating Weight: 21,000
- All piping to be Sch 80 PVC
- All conduit and fittings to be Liquidtight Flexible Nonmetallic Conduit
- Skid to be prewired and tested.
- 480 VAC
- FKC recommends 1-1/2" grout under all equipment foot pads.



Velodyne Polymer System
that is mounted, wired and piped to the skid
but can be removed and installed against the wall for
permanent installation.

Job No.	Customer REFERENCE		Wt. Lbs.
Drawing No.	Title BHX-800x4500L Screw Press Dewatering Skid Assembly Details		Quantity 1
			Date 8/18/22
	FKC CO. LTD 2708 W 18th St. Port Angeles, WA 98363 (360) 452-9472 Fax (360) 452-6880		Drawn By RTB

PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FKC CO LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FKC CO LTD IS PROHIBITED.

No.	Alteration	Date	Sign
3			
2			
1			
0			

Revision

☑ Checkmark signifies FKC compliance with specification. A hashtag with a number (Example: #1) shows an FKC clarification or exception with description provided.

SECTION 46 76 27

SCREW PRESS DEWATERING EQUIPMENT

PART 1 - GENERAL

☑ 1.01 SECTION INCLUDES

☑ A. Requirements for furnishing installing a complete screw press dewatering system and all appurtenances specified, or otherwise required, for a complete and properly operating system. The system will be temporarily used to treat waste activated sludge from a sludge blend tank. The system will then be used to treat digested sludge from anaerobic digester.

☑ B. If required to meet the Project schedule, the screw press dewatering system manufacturer may propose alternative components for consideration during bidding. The alternative components must be equal in quality and function to the components included in this specification. Alternative components must also be industry standard components and components that are typically used by the manufacturer.

☑ C. Equipment Numbers

1. Screw Press: Tag No. DEW-250-02
2. Flocculation Tank: Tag No. MIX-250-01
3. Polymer Blending Unit: Tag No. POL-250-04
4. Control Panel: Tag No. LCS-250-01

☑ D. Scope of supply:

1. One (1) screw press dewatering unit, including supports
2. One (1) flocculation tank including mixer
3. One (1) polymer blending and injection system for liquid polymer, including a polymer blending unit.
4. One (1) control panel
5. Mounting equipment, anchor bolts, concrete anchors, and other anchoring devices
6. Spare parts
7. All other accessories and appurtenances required to provide a complete and fully functional screw press dewatering system for Owner's use, whether or not specifically indicated in this Section.
8. Screw press, flocculation tank, polymer blending unit, control panel, and all other accessories and appurtenances will be integrally mounted as components of a dewatering skid, each component prewired and pre-piped to each other on the dewatering skid from the factory.
9. Two shaftless screw conveyors (one inclined conveyor and one horizontal conveyor) will not be integrally mounted to the skid and are to be provided loose and separate from the skid. See Section 41 12 13 for conveyor specifications.

#66 FKC scope and pricing provides anchor bolt Structural PE Oregon calculations for the skid, but does not include anchor bolts. Anchor bolts to be provided by others.

Dewatering skid will have a junction box near the screw press discharge end for all power and signal wiring requirements of the conveyor.

E. Intent of Drawings

1. Drawings show only general locations of equipment, devices, and supports.

2. The Drawings are based on equipment that is manufactured by the first manufacturer named in Paragraph 2.01 of this Specification Section. This first named manufacturer is also listed in the bid form "Major Equipment of System Schedule Supplied by the Construction Contract". The Contractor shall be responsible for the design and construction of any modifications that are necessary to install dewatering equipment provided by another manufacturer. All modifications to the design are subject to approval by the Engineer.

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals
2. Section 01 61 10 – Seismic Design Requirements
3. Section 01 66 00 – Material and Equipment
4. Section 01 78 23 – Operations and Maintenance Data
5. Section 01 79 00 – Training
6. Section 01 81 00 – Equipment Startup and Testing
7. Section 01 99 00 – Reference Forms
8. Section 05 50 01 – Anchor Bolts and Anchoring Devices
9. Section 09 96 00 – High Performance Coatings
10. Section 11 05 13 – Electric Motors
11. Section 40 78 00 – Panel Mounted Equipment
12. Section 41 12 13 – Shaftless Screw Conveyor
13. Section 46 05 13 – General Requirements for Equipment
14. Section 46 05 14 – Equipment Mounting
15. Section 46 33 33 – Polymer Blending Units

1.03 REFERENCED STANDARDS

A. This section contains references to the following documents. They are part of this section as specified and modified. In case of conflict between the requirements of the section and those of the listed documents, the requirements of this section shall prevail.

1. ASTM A322: Carbon and Alloy Steel Bar Specifications
2. ASTM A507-10: Standard Specification for Drawing Alloy Steel, Sheet and Strip, Hot-Rolled and Cold Rolled
3. ABMA, Standard 9-90: Load Rating and Fatigue Life for Ball Bearings

4. ABMA, Standard 11-90: Load Ratings and Fatigue Life for Roller Bearings

5. AWS, D1.1: Structural Welding Code

1.04 SUBMITTALS

A. General

1. Comply with Section 01 33 00.

2. Include a checked-off copy of this specification with deviations noted, per Section 01 33 00.

3. Include a copy of the contract document mechanical layout drawings, control diagrams and process and instrumentation diagrams, with addenda updates, that apply to the equipment in this section.

   a. Mark to show specific changes necessary for the equipment proposed in the submittal.

   b. If no changes are required, mark the drawing or drawings "No Changes Required".

   c. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

4. In all submitted product data, call out model, configuration, size etc. of proposed equipment and/or cross out model, configuration, size etc. of non-applicable equipment.

   a. Failure to comply with this requirement is sufficient cause to reject the entire submittal.

B. Bill of Materials with quantity, originating manufacturer and part number, and description. List all spare parts separately at the end of the Bill of Materials.

C. Product Data

1. Submit manufacturer's standard catalog data, descriptive literature, motor and drive system data, parts list, equipment weights and lifting points, and detailed specifications describing all system components forming a part of the equipment furnished under this section.

2. Submit coatings information. Refer to Section 09 96 00.

D. Calculations

1. Submit anchor bolt design calculations, stamped and signed by an Oregon registered professional civil or structural engineer. Comply with Sections 01 61 10, and 05 50 01.

2. Calculations documenting the AGMA rating of the drive unit and life of the main bearing for spur and helical gears. For other gearbox types provide manufacturer's catalog engineered rating of the drive unit and calculated life of the main bearing.

☑ E. Shop Drawings

1. Submit drawings showing the general arrangement of the entire assembly, including:
   a. Dimensional information
   b. Plan and section views of the equipment layout
   c. Location and size of piping connections
   d. Auxiliary equipment locations
2. Submit manufacturer's equipment mounting instructions, requirements and detailed drawings for the installation of the screw press and flocculation reactor.

☑ F. Submit a certificate of Unit Responsibility. See Section 01 99 00.

☑ G. Submit motor data in accordance with Section 11 05 13.

☑ H. Submit equipment mounting information in accordance with Section 46 05 14.

☑ I. Submit a written report on results of factory testing specified in Part 3 below.

☑ J. Submit proposed on-site testing and start-up procedures, including sketches and calculations for specified tests.

☑ K. Manufacturer's Experience and Qualifications

1. Submit a list of at least twenty (20) installations in which the proposed screw press equipment, of similar or larger capacity, including flocculation reactor system, has been installed and is in operation in municipal wastewater treatment applications. Provide installation date, system solids and hydraulic capacities, and owner contact information for each installation.
2. Submit manufacturer's ISO 9001 certification or other QA/QC documentation and forms.

☑ L. Electrical Information

1. Electrical Drawings
   a. Equipment elevations with enclosure details drawn to scale.
   b. Electrical One-line and Elementary diagrams
   c. PLC I/O diagrams
   d. Interconnection diagrams

#1: Standard FKC/TSI drawings will be provided. PLC I/O Diagrams and Interconnection diagrams are not included, but pertinent info is available within FKC/TSI standard drawings.

2. Catalog Data for each component used in the construction of the assembly and control panel:
   a. Instrumentation data summary sheets to include instrumentation type and tag name, description, manufacturer's model number and part number with all proposed options, range, span, engineering units, input and output characteristics.
   b. Description of component as it relates to the model number. For each portion of the model number the associated description shall be shown.
   c. Manufacturer's literature, illustrations, specifications and engineering data including: materials, dimensions, weight, performance, and ordering

information with applicable features and options highlighted, circled, or "arrowed."

1) Manufacturer's data not properly marked will not be accepted for review.

d. Manufacturer's description or equipment features.

e. Physical size and mounting details.

☑ 3. Control Panel with Programmable Logic Controller (PLC) and Operator Interface (OI). Submit the following documentation for approval.

a. Complete information, catalog cuts, and Bill of Materials for the control panel hardware, software, and configuration.

b. PLC Ladder diagrams of the control system programming logic.

1) The Supplier shall submit the ladder logic diagrams utilizing AB RX Logix software or copy of ladder logic file compatible with RX Logix.

2) A narrative functional description shall accompany the ladder diagram describing system operation on a line-by-line basis.

c. OI graphic screen printouts for all proposed graphic screens.

d. PLC I/O lists and control descriptions. I/O tags shall be those designated on the Contract Drawings P&IDs.

e. Submit software operations manual including, as a minimum:

1) Program code

2) Tag database

3) Setpoint listings with description

4) Program description

5) Register cross reference listing

6) Configuration and set-up

7) Data tables

8) Special files

f. Electronic copies of proposed PLC ladder logic program listing and OI graphic screens.

☑ M. Complete and submit the following forms from Section 01 99 00:

1. Motor Data Form.

2. Unit Responsibility Form.

3. Extended Warranty Forms.

☑ N. Bench Scale Test Report

1. Manufacturer shall test polymers and make at least two (2) preliminary selections for use during acceptance testing, as specified in 1.05.E.

2. Submit bench test results and polymer selections.

3. Include the following:

   a. Narrative description of equipment used for bench testing

   b. Narrative overview of testing procedures

4. Contractor shall collect samples and ship them to the manufacturer.

☑ O. Deferred Submittals:

1. Factory Tests

   a. Submit certified shop inspection reports indicating that all components of the screw press dewatering equipment have been factory-tested in accordance with the manufacturer's requirements and that the components meet or exceed the requirements of this Section.

   b. Submit a minimum of 10 days prior to equipment shipment.

2. Submit operating and maintenance (O&M) information as specified in Section 01 78 23 a minimum of 10 days before equipment shipment.

3. Submit additional forms required following startup and training per Part 3. Include forms in final O&M manual.

4. Submit certification of shop trial assembly and photographs of assembly a minimum of 10 days before shipment.

5. Submit shop inspection records and evidence of inspector qualification a minimum of 10 days before shipment.

6. Following installation and startup, submit completed Manufacturer's Installation Certification Form.

☑ 1.05 QUALITY ASSURANCE

☑ A. Comply with Section 46 05 13.

☑ B. Manufacturer

1. A minimum of 15 years of experience in the design, application, and supply of screw press dewatering equipment in municipal wastewater treatment plants.

2. A minimum of 20 municipal installations in the United States, Europe and/or Australia in operation for more than one year.

☑ C. Unit Responsibility

1. Assign unit responsibility, as specified in Section 46 05 13, to the screw press dewatering equipment manufacturer for the equipment specified in this Section.

2. Manufacturer shall provide screw press, flocculation reactor tank, polymer system including polymer blending unit, mixers, motors, gear reducers, VFDs, controls, control panels, and lifting attachments as a complete integrated package to ensure proper coordination, compatibility, and operation of the system.

D. Coordination

1. Contractor shall coordinate all details of the equipment with other related parts of the work. Contractor shall verify that all structures, piping, wiring and equipment components are compatible. Contractor shall be responsible for all structural and other alterations required to accommodate equipment differing in dimensions or other characteristics from these specifications and the Drawings.

2. Coordinate the design, fabrication and installation requirements for sludge feed piping and pipeline appurtenances not supplied by the screw press manufacturer.

3. Coordinate PLC I/O data table with Application Programmer performing SCADA and PLC programming on other PLCs for the Project.

#2: FKC offers only the PLC, Ethernet switch and OIT listed in FKC proposal.

4. Contractor to coordinate PLC, Ethernet switch and operator interface panel required in this specification with those specified in Sections 11362, 11374 and 11377 so one manufacturer and model of each type of equipment is supplied on this project

E. Bench Scale Testing:

1. Contractor shall provide sludge samples to screw press dewatering equipment manufacturer.

2. Sludge samples shall be obtained by the Owner from existing belt filter press feed before polymer addition. Contractor shall provide sampling instructions to Owner and coordinate scheduling of sampling.

3. Sludge sampling shall be performed at a time when the sludge conditions are within the ranges specified for Condition 1 in paragraph 2.03.

4. Contractor shall be responsible for shipping sludge samples to screw press dewatering equipment manufacturer.

5. Upon receipt of sludge samples, manufacturer shall test polymers and make at least two (2) preliminary selections for use during acceptance testing.

6. Submit bench test results and polymer selections.

1.06 WARRANTY

A. Provide a written extended warranty from the manufacturer for the equipment specified in this Section.

#3: See Extended Warranty Form for details.

1. Extended Warranty Period: Ten (10) years from successful completion of the demonstration period for the dewatering system.

2. Coverage: Cover defects or failures of materials or workmanship which occur as the result of normal operation and service.

3. Complete the Extended Warranty Form in Section 01 99 00.

B. Screw Press Dewatering Equipment Performance

1. Guarantee screw press dewatering equipment performance as specified in paragraph 2.03 when flow and water quality parameters conform to those specified in paragraph 2.03.

#4: Included in FKC scope of supply are two performance trips; one for WAS sludge and one for Anaerobic Sludge to demonstrate performance. FKC will submit a performance report for each trip. No other performance compliance or performance period length guarantee is offered due to other operating conditions beyond FKC's control.

2. Length: 2 years from successful completion of the demonstration period for the dewatering system.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. FKC Co., Ltd. (Port Angeles, WA)

B. Or equal, as specified in Section 01 33 00

2.02 OVERALL SYSTEM REQUIREMENTS

A. Design to receive, flocculate, condition, and dewater the feed sludge specified herein, and neatly discharge the dewatered sludge cake into the existing discharge chute.

B. Design to accommodate municipal secondary wastewater solids without jamming, clogging, or overflow.

C. Design to operate continuously 24 hours per day, 7 days per week or intermittently.

D. Design to operate in both manual and fully automatic modes.

E. Design to operate at variable rates to accommodate varying combinations of sludge concentration, sludge feed rate, and polymer addition, in order to optimize cake solids concentration, capture rate and polymer use. Tracking sludge concentration changes is not required.

F. Screw press shall be capable of retaining a plug of feed and/or dewatered sludge inside the dewatering screen basket for up to 72 hours without adversely impacting screw press components or startup procedures for the subsequent dewatering run.

G. Structural Design

1. Design and manufacture all components to handle the forces that may be exerted during fabrication, shipping, erection, and proper operation according to the O&M manual.

2. Design so that jamming at any point will cause the drive motor to stall without resulting in component damage or structural failure.

a. Provide motor load setpoints in PLC and VFD.

H. Provide drains with the ability to drain all liquid and feed sludge from the dewatering and flocculating equipment and piping.

I. Corrosion Control

1. Equipment design shall not result in crevices, unsealed overlapping plates and similar inaccessible areas where corrosion can take place without allowing access for application of preventive measures.

2. It may be expected that the material discharged to each screw press will be in an actively digesting state.

3. Corrosive agents (moisture, hydrogen sulfide gas, sulfuric acid, etc.) will be present at all times.

J. Inspection, Maintenance, Repair and Adjustment Provisions

1. Provide sufficient room for inspection, maintenance, repair and adjustment.

2. All components shall be so arranged that they can be serviced from the operating floor or from the permanent access platforms shown on the Drawings.

K. The sludge is expected to contain quantities of industrial and municipal wastes including solvents, petroleum products, grit, hair, rags, grease, rubber goods, and organic solids.

2.03 DESIGN CRITERIA & PERFORMANCE REQUIREMENTS

A. Provide screw press equipment suitable for the following conditions:

Item	Value	
	Condition 1	Condition 2
Type of sludge	Waste Activated Sludge	Anaerobically Digested Sludge
Upstream sludge storage/stabilization	Secondary Treatment	Anaerobic Digestion
Feed solids concentration	0.5 – 2.0%	1.0 – 2.5%
Hydraulic Loading Rate	10 gpm, min 100 gpm, max	10 gpm, min 100 gpm, max
Average Solids Throughput	458 dry pounds per hour (per unit)	458 dry pounds per hour (per unit)
Volatile solids ratio	60 – 75	45 - 50
Temperature	45 – 95 °F	45 – 95 °F
pH	6.0 – 8.0	6.0 – 8.0
Flocculant	Liquid Emulsion Polymer	Liquid Emulsion Polymer
Maximum polymer consumption, lbs active polymer/dry ton of solids	30	35
Effluent cake solids concentration	15%	18%
Minimum solids capture	95% minimum or 750 mg/L TSS maximum	95% minimum or 750 mg/L TSS maximum

#5: FKC screw press offered has a capacity for WAS processing of 375 dry pounds per hour (per unit)

B. Meet the performance requirements with either more than one commercially available polymer, or with a polymer that is commercially available from more than one vendor.

2.04 MATERIALS

A. Screw press and flocculation reactor components shall be manufactured from Type 304 or better stainless steel shapes (rods, angles, and channels), pipes, and sheets unless otherwise specified.

1. This requirement includes, but is not limited to, the following:

a. Screw

b. Screw shaft

c. Perforated plate basket

d. Screw press cover and inspection lids

e. Screw press frame

#6: Flex coupling for piping between screw press and flocculation tank is made of rubber.

f. Screw press and flocculation reactor support structures

g. Piping connections

#7: See Section 40 78 00 comments.

2. Control panel enclosure: Type 316 stainless steel

3. Fasteners and anchor bolts: Type 316 stainless steel or Type 304 stainless steel

4. Minimum stainless steel sheet thickness (excluding cover parts & assemblies): 1/8 inch.

5. Elastomer seals on helical screw flights, if required, shall be wear-resistant nylon or polyurethane. The seals shall be held in place by Type 316 stainless steel clamps and bolts which can be easily removed. Seals shall be replaceable without removal of the screw.

B. Bearings shall be anti-friction, and may be grease lubricated.

2.05 FABRICATION

A. Screw press shall be manufactured in a manner to prevent contamination of the stainless steel with rusty dust.

#8: See Attachment A: FKC Passivation Techniques

B. All stainless steel components and structures shall be pickled with nitric acid and hydrofluoric acid to remove any residues that may be present on the material as a result of forming, manufacture, or handling. After pickling, wash the equipment with a high-pressure wash of cold water to remove any remaining surface debris and promote the formation of an oxidized passive layer.

C. Perform all welding in accordance with American Welding Society (AWS) D1.1 Structural Welding Code, or equivalent.

2.06 SCREW PRESS

A. Design the screw press to be installed horizontally.

B. Dewatering of the sludge shall take place in a perforated plate basket, consisting of a minimum of four sections of perforated plate.

1. Provide longitudinal flanges to allow basket disassembly.

C. The screw press shall be completely enclosed to prevent odor emission.

1. The entire dewatering section and basket area shall be easily accessible through inspection lids, which are mounted on the sides of the machine.

2. Minimum five inspection lids each side of screw press.

3. Inspection lids shall be easily removed and contain all liquids and aerosols resulting from normal dewatering and spray washing operations.

a. Lifting weight of each inspection lid shall be limited to 21 lbs.

D. Employ a shafted, helical screw installed inside of the screen basket to transport sludge from the inlet to the discharge area at the end of the pressure zone.

1. A shaftless screw is not acceptable.

2. Taper up screw shaft diameter towards the discharge section of the machine.

3. A bearing shall support the drive end of the screw shaft. Wear strips are not acceptable.

☑ E. Drive motor

1. Location

   a. FKC: Provide an in-line, flange mounted motor at the inlet end of the screw press.

   b. Other manufacturers: The screw press drive motor may be located at either end of the screw press.

2. Motor speed shall be controlled with a VFD.

3. Gear drive unit shall be directly coupled to the screw shaft.

4. Motor shall be directly coupled to the gear reducer or may drive the gear reducer using a belt drive.

5. All motor couplings and other high-speed rotating parts shall be provided with OSHA-approved guards.

☑ F. Clean the perforated screen basket from the outside using a spray bar washing system made of stainless steel piping and stainless steel or PVDF spray nozzles. Plastic nozzles are not acceptable.

1. Cleaning shall not interrupt dewatering operation.

2. The spray area shall cover the entire length of the screen. One or more solenoid valves shall control the flow to the spray bar washing system.

3. Clean the entire surface area of the basket during each cleaning cycle.

4. Provide minimum 1.25-inch connections for cleaning water supply connections to the spray system.

5. Water pressure at each nozzle of the spray bar shall be a minimum of 40 PSIG.

6. Average spray water consumption shall not exceed 72 gallons at 40 PSIG per wash cycle.

☑ G. If required, provide a pneumatically actuated cone to adjust the pressure in the pressure zone at the discharge end of the screening basket.

1. Adjust pressure on the cone manually through an air pressure regulator installed on the screw press

2. Provide a one-quarter inch (1/4") industrial style stainless steel female quick coupler for pressurized air supply connection at the manifold of the pneumatic system.

☑ H. Sludge cake shall be automatically discharged through a rectangular sludge discharge opening.

I. Screw Press Drive

1. The press screw shall be driven by a shaft mounted gearbox or speed reducer, and an electric motor

   a. The gear reducer or speed reducer shall be bolted to a machined flange welded to the inlet end of the press.

   b. The motor may be bolted directly to the gear reducer or speed reducer, or may drive the gear reducer using a belt drive.

#9: ????

   c. Minimum L-10 bearing life of motor and gear reducer or speed reducer: 100,000 hours.

2. Gear Reducer:

   a. Maximum gear reducer output speed: 0.35 rpm at 100 percent motor speed.

   b. AGMA Class 2, service factor 1.5

3. Drive motor:

#10: FKC and Sumitomo reserve the right for gear reducer selection per Sumitomo catalog selection tables.

   a. Comply with Section 11 05 13.

   b. Type 2 Motor, inverter-duty, NEMA Design B.

   c. Minimum service factor: 1.15

   d. Size: maximum 2 hp

   e. Power: 480 volt, 3 phase, 60 Hertz.

   f. Nominal maximum speed: 1,800 rpm.

J. Piping connections:

1. All piping connections 3 inches or larger shall be ANSI, Class 150 standard raised face flanges:

#11: Screw press inlet connection diameter is 8-inch.

   a. Single 6-inch or larger bottom drain connection for conveyance of screw press filtrate

   b. 6-inch minimum diameter inlet connection for feed sludge

2. All piping connections 2.5 inches and smaller shall be threaded

   a. 2-inch diameter connection for cleaning water supply on top of press

#12: connection for cleaning water supply at drive is 1.25-inch

   b. 1.5-inch diameter connection for cleaning water supply at sludge inlet

   c. 1.5-inch diameter connection for cleaning water supply at drive

K. Headbox Level Transmitter

1. Provide pressure sensor for level with 4-20mA output.

2. IFM eFector PI-001BREZ02-MFRKG/US, or approved equal

#13: See FKC comments on P&ID drawing I-251.

2.07 UTILITY WATER MANIFOLD

A. Provide utility water manifold and water panel per P&ID drawing I-251.

B. Manifold shall have a common 2-inch header that serves three separate wash water headers.

C. A flow switch shall be provided on the 2-inch common header.

D. Each wash water header shall be provided with the following

1. Solenoid valve

2. Isolation ball valves

3. Bypass pipe

☑ 2.08 FLOCCULATION TANK

☑ A. Provide a flocculation tank for mixing and aging of polymerized sludge prior to dewatering.

☑ B. Construct wetted parts of Type 304 or better stainless steel.

☑ C. Include anti-rotation baffles.

☑ D. Design for a retention time of 2.0 – 4.0 minutes at the design flow rate.

☑ E. Minimum tank volume shall be 285 gallons.

☑ F. Locate the inlet at the bottom and the conditioned sludge outlet near the top of the tank.

☑ G. Provide a mixer.

1. Motor size: 1.0 hp minimum, 1,800 rpm, 480 volts, 3 phase.

2. Drive:

a. Variable speed drive with shaft speed range of 13-64 rpm

b. Gear reducer: SEW Eurodrive Varimot Variable Speed Gearmotor, Nord, or equal.

3. Control speed through dewatering system control panel.

☑ H. Provide stainless steel support structure for flocculation chamber, including mounting hardware.

☑ I. Provide the capability to visually inspect floc formation, either directly in the flocculation tank, or in discharge piping.

☑ J. Piping connections:

1. 4-inch diameter ANSI, Class 150 standard raised face flange, bottom connection for inlet sludge

2. 8-inch diameter pipe stub with flexible coupling outlet connection for polymer conditioned sludge

☑ K. Flocculation Tank High Level Alarm

1. Provide level switch in the tank for high-high level alarm.

2. Provide Warrick 16MA1B0, or approved equal.

#13: See FKC comments in Section 46 33 33.

2.09 POLYMER BLENDING AND INJECTION SYSTEM

A. Provide a skid mounted polymer blending unit per Section 46 33 33.

B. Polymer blending unit shall meet the following requirements:

1. Designed to activate liquid emulsion polymer.

2. Capable of mixing, blending and aging liquid polymer on a continuous basis to meet screw press requirements.

3. Include a neat polymer pump and hose connections that allow for polymer to be withdrawn from either 55-gallon drums or 275-330-gallon IBCs (totes).

2.10 SHAFTLESS SCREW CONVEYORS

A. Provide shaftless screw conveyors per 41 12 13

#14: See FKC comments in Section 41 12 13.

2.11 COATINGS

A. Factory coat non-stainless steel components per Section 09 96 00.

2.12 CONTROL PANEL

A. A control panel shall be provided for controlling the screw press, flocculation tank, polymer blending unit, and conveyors specified in this Section.

B. The control panel shall be cooled to maintain the operating temperatures of all components inside the control panel.

C. The control panel shall be rated for 65,000 AIC minimum.

#15: Per requested delivery time, breaker availability may prohibit FKC from supplying this rating, but a reasonable effort will be made to accomplish this.

D. The control panel shall meet the requirements of Section 40 78 00 Panel Mounted Equipment. #16: See FKC comments in Section 40 78 00.

E. The Control Panel shall have the following components

1. Housing See FKC comment #16 above.

a. Provide stainless steel, NEMA 4X enclosure per 40 78 00.

2. Switches and Indicator Lights

a. Provide switches and indicators per 40 78 00

b. Flocculation Tank Mixer

1) Local-Off-Remote switch

2) On-Off-Auto switch

#17: FKC to only provide HOA switch for floc tank mixer.

3) Running indicator

4) Failure indicator

5) Speed selector switch

c. Screw Press

1) Local-Off-Remote switch

2) On-Off-Auto switch

#18: FKC to only provide HOA switch for screw press.

3) Running indicator

4) Failure indicator

5) Speed selector switch

d. Conveyor #19 Conveyors (Qty 2)

1) Local-Off-Remote switch

2) On-Off-Auto switch

#20: FKC to only provide HOA switch for each conveyor.

3) Running indicator

4) Failure indicator

5) Speed selector switch

☑ 3. Hardwired Alarms

a. Provide at minimum the following hardwired input alarms that shall be monitored by the control panel:

1) 120VAC Power OK

2) Floc Tank Level Switch Hi-Hi

3) Floc Tank Mixer In-Auto

4) Floc Tank Mixer Running

5) Screw Press In-Auto

6) Screw Press Running

7) Screw Press Fail

8) Polymer System In-Auto

9) Polymer System Running

10) Polymer System Trouble

b. Provide at minimum the following hardwired outputs from the control panel:

1) Floc Tank Mixer Run Command

2) Screw Press Run Command

3) Polymer System Run Command

c. Provide at minimum the following analog inputs that shall be monitored by the control panel:

1) Floc Tank Mixer Speed Feedback

2) Screw Press Speed Feedback

3) Screw Press Headbox Level

4) Wastewater Solenoid 1 Open Command

5) Wastewater Solenoid 2 Open Command

6) Wastewater Solenoid 3 Open Command

d. Provide at minimum the following analog outputs from the control panel:

1) Sludge Feed Pump Speed Command

2) Floc Tank Mixer Speed Command

3) Screw Press Speed Command

4) Polymer System Speed Command

☑ 4. Touch Screen

#21: HMI provided by FKC will be 24VDC.

a. Touch screen shall be Allen Bradley PanelView Plus 7 Color touch screen in minimum 15" size with minimum 640x480 resolution, 120VAC or approved equal.

b. Provide the following control functions on the touch screen, where applicable:

1) Auto/Manual Selection

2) Sludge Feed Flow

3) Screw Press Speed

4) Polymer Water Feed Rate

5) Alarm Silence

6) Alarm Reset

7) Manual Start/Stop

8) Screen Contrast

9) Low Polymer Water Fault

10) Washwater Selection

11) Automation Set Points

a) Feed sludge flow rate

b) Polymer dose relative to flow

c) Headbox level

c. Display the following on the touch screen:

1) Sludge feed flow (gpm)

2) Screw press speed (rpm)

3) Diluted polymer solution feed rate (gpm)

4) Neat polymer feed rate (gph)

5) Automation Status

6) Polymer Pump Status

7) Alarm indications

8) Fault History

5. Variable Frequency Drives

a. AB Powerflex 525 series

b. Variable frequency drives (VFDs) shall be provided for the screw press and flocculation tank

c. Each variable frequency drive (VFD) shall be provided as a standalone unit. The VFD shall be of the latest technology capable of driving variable or constant torque motor loads at variable speeds to control and/or maintain a process variable (level, flow, pressure, etc.) by varying the motor speed. The VFD shall have the following attributes:

d. The VFD shall use high efficiency sinusoidal PWM (pulse width modulation) control of IGBT power transistors.

e. Alpha-numeric human interface module (HIM) digital display with keypad to view and adjust diagnostic and status indicators. HIM shall be on VFD inside panel enclosure.

f. Continuously operable in ambient temperatures, 25°F to 110°F (-4°C to 43°C), and relative humidity, 95% non-condensing.

g. Automatic fault reset to automatically restart the drive after any type of fault condition -- up to three attempts. When the drive is locked out after its automatic reset attempts the operator shall be able to reset the VFD by cycling power or via keypad.

h. Digital inputs for start, preset speed and direction; relay outputs for alarm and run; 4-20 mA input for speed command; 4-20 mA output for speed indicator.

6. VFD Line Reactors

a. Hammond Power Solutions CRX Series, or approved equal.

b. Reactor construction shall be iron core with a minimum impedance of (3) percent.

c. Reactor windings shall be copper or aluminum wound.

d. Reactor insulation shall be Class H with a 115 degree C rise over 50 degree C ambient.

e. Reactor shall be rated for system voltage and frequency.

7. Programmable Logic Controller (PLC)

a. Allen Bradley CompactLogix 1769-L3X series, or 5069-L3X series.

b. PLC shall have no imbedded input/output (I/O) controllers.

c. Provide input/output (I/O) modules as required for a functional system as specified.

#22: PLC provided by FKC will be model 1769-L3x. Due to delivery times, exact model will be based on availability.

8. Unmanaged Ethernet Switch

a. Allen Bradley 1783-US8T, or approved equal.

#25: All conduit provided on the skid and conveyors will not be PVC-coated galvanized steel. It will be Hubbel LFNC-B non-metallic liquidtight that meets NEC code for this application.

b. Ethernet switch shall be modular style, suitable for use in harsh industrial environments.

c. Switch shall be UL Listed and EtherNet/IP Certified.

d. Port count shall be at minimum (8).

e. Copper Ethernet connectors shall be RJ45.

☑ 9. Control Power Transformer

a. Shall be GE, Hammond Power Solutions, or approved equal.

b. Shall be 480VAC, 1-phase primary and 120/240VAC 1-phase secondary.

c. Minimum output shall be 3000VA.

☑ 10. Uninterruptible Power Supply (UPS)

a. Control panel shall include an uninterruptible power supply for backup power.

b. Power supplies shall be rated for 1000VA, 120VAC, 60Hz.

c. Power supplies shall be UL508 listed

☑ 11. Programmable Logic Controller (PLC)

a. CompactLogix 1769-L3xER series CPU with standalone I/O

☑ 12. Programming

#23: For program provided by FKC, some programming will be in function block, but it will be very minimal.

a. Provide all programming of PLC and OIT per this specification Section and Section 40 61 916.13 Control Descriptions. All programming shall be ladder code only.

b. Provide graphics on OIT to be migrated to plant SCADA system as part of a future project.

c. Program all alarms using the "ALMA" & "ALMD" blocks in the PLC to report to an Alarm Server installed as a future project. Also provide a digital output to a Relay that includes all Dialout Critical Alarms. This will be used to trigger a Banner Radio signal to a Dialer System. Radio and dialer system installed by others.

#24: No junction boxes for power or communication to the dewatering skid are provided. All power and communication connections will be made directly to the control panel on the skid.

☑ 2.13 OTHER ELECTRICAL COMPONENTS

A. Manufacturer shall provide provisions for separate power and communication utility connections. Provide two junction boxes, sized by the Manufacturer, for power and communication. Provide power distribution blocks, including grounding provisions, for the power connection. Provide a grounded RJ45 connection, suitable for accepting 600-volt, CAT6 Industrial Ethernet cabling. The boxes shall be sized to include adequate space for terminations and cable bending radii as required by UL and the NEC.

B. All equipment-mounted conduit shall be PVC-coated galvanized steel conduit or 2-foot maximum length non-metallic liquid tight conduit.

2.14 SPARE PARTS

A. The following spare parts shall be included and supplied together with the equipment:

1. One (1) set of helical screw flight seals with mounting hardware (if required)
2. One (1) set bearing assemblies for screw shaft
3. One (1) solenoid valve of each size for spray bar washing system
4. Ten (10) nozzles for spray bar washing system

#26: Not applicable and not provided by FKC.

B. Spare parts shall be packaged with labels indicating the contents of each package, and shall be delivered to Owner as directed.

PART 3 - EXECUTION

#27: To meet delivery times, FKC standard testing forms and procedures will be used for factory testing without any prior submittal for their use.

3.01 FACTORY TESTING

A. All major system components shall be factory tested for compliance with the construction and functional requirements specified herein. A copy of the test reports, certified by an officer of the Supplier, shall be submitted prior to shipment.

3.02 WIRE MARKING

A. All panel, enclosure and field wiring shall have wire labels on both ends of each wire. Labeling shall be neatly installed for visibility and shall be clearly legible. Each conductor of instrument shielded signal wiring shall be labeled. Wire labels shall be machine printed with on white heat shrinkable tubing. Each label shall fit a minimum 23 characters, 3/16" in height before shrink. Tubing shall be oversized for the wire and shrunk into place using an electric heat gun. The "shrunk" label shall have just enough give to allow the label to be rotated. Hand lettered wire labels are not acceptable and shall be replaced at the Supplier's expense. Provide Brady "PermaSleeve" or approved equal.

B. Wiring Methods:

1. Wiring Separation: Wires carrying 100 volts and above shall be physically separated from lower voltage wiring by using separate bundles or wire ways with sufficient distance to minimize the introduction of noise, crossing only at 90 degree angles.

2. Harness: All wiring shall be neatly bundled and laced with plastic tie-wraps, anchored in place by screw attached retainer. Where space is available, wiring shall be run in slotted plastic wireways with dust covers. Wireways shall be sized such that the wire fill does not exceed 60%. Tie-wraps shall be T&B TY-RAP or approved equal.

3. Retainers: Wireways, retainers, and other devices shall be screw mounted with round-head 316 stainless steel screws or mechanically mounted by push-in or snap-in attachments. Glue or sticky back attachment of any type or style shall not be used. Retainers shall be T&B TC series or approved equal.

4. Hinge Loops: Where wiring crosses hinged surfaces, provide a "U" shaped hinge loop protected by clear nylon spiral wrap. The hinge loop shall be of sufficient length to permit opening and closing the door without stressing any of the terminations or connections. Spiral wrap shall be Graybar T25N or approved equal.

5. Routing: Wires and cable shall be routed along the shortest route between termination points, excepting routes which would result in routing 120 VAC and other wires and cables in the same duct or bundle. Wires and cables shall have sufficient length to allow slack and to avoid any strain or tension in the wire or cable.

6. Wires shall be routed in slotted plastic wireways with snap covers. Wires carrying 120 VAC shall be separated as much as possible from other wires and signal cables, and shall be routed only in ducts for 120 VAC. If the power wiring has to cross the signal wiring, the crossing shall be as close to a right angle as possible. Wireways for 24 VDC wiring shall be used for all other wires and cables. Routing of 120 VAC in combined wireways shall be minimized. Wires and cables shall be placed in the wireways in a straight, neat and organized fashion and shall not be kinked, tangled or twisted together. Additional wire ducting shall be provided for use by the electrical subcontractor for routing field wires to their landing points in the each electrical and instrumentation panel.

7. Provide 2" minimum separation between wireway and terminal blocks.

8. Wiring not routed in wireways shall be neatly bundled, treed, and laced with plastic ties.

3.03 ELECTRICAL CONSTRUCTION METHODS

A. Mating fittings, bulkhead fittings, plugs, connectors, etc. required to field interface to the equipment and panels shall be provided by the when the equipment is delivered.

B. All electrical and instrumentation drawings associated with the equipment shall be provided with the equipment when it is delivered to the job site. Drawings for each piece of equipment shall be placed in clear plastic packets of sufficient strength that will not tear or stretch from drawing removal and insertion.

C. Electronic PDF version of O&M, electrical and instrumentation drawings associated with the equipment and electronic copies of the PLC and OI programs shall be provided on a USB drive with no password protection on a lanyard and placed within the panel. Label drives with clear plastic with black machine printed lettering as produced by a KROY or similar machine. The size of the nameplate tape shall be with 3/8-inch lettering unless otherwise approved by the Engineer. Securely fasten nameplates in place on the USB drive using the adhesion of the tape.

3.04 SHIPMENT AND STORAGE

A. Comply with Section 01 66 00.

B. Site Storage and Handling of Equipment

1. Store the supplied equipment in accordance with the manufacturer's recommendations and instructions.

2. Store gear reducers / speed reducers and motors in buildings or trailers and protected from dust, dirt, and moisture.

3. Take responsibility for work, equipment, and materials until inspected, tested and finally accepted.

#28: FKC representative shall do site visit for installation compliance review during same trip as testing (Pre-Operational, Functional, & Operational testing combined trip).

3.05 INSTALLATION

A. The equipment Supplier's representative shall be available by telephone as required during construction. During equipment installation, the Supplier's representative shall visit the site as needed to insure that the installation is in compliance with the Supplier's recommendations and instructions, and the requirements of this Proposal.

B. Contractor shall provide temporary or rental hoisting equipment to facilitate installation.

3.06 SUPPLIERS' CERTIFICATION

A. Prior to system startup and functional testing, all equipment described herein shall be inspected by the Supplier's representative for proper alignment, proper connection, and satisfactory performance of all components.

B. The Supplier's representative shall approve installation and provide certification using Manufacturer's Installation Certification Form in Section 01 99 00.

3.07 EQUIPMENT START-UP AND TESTING

A. Comply with Section 01 81 00.

B. Proposed test procedures shall be developed by the installation screw press equipment Supplier's representative. The procedures shall be submitted to the Owner and installation Contractor and reviewed by the Owner before scheduling and performing the functional test.

C. Testing shall be conducted by the Supplier's representative and installation Contractor and witnessed by the Owner. The testing shall demonstrate that the dewatering equipment and related control system operate in accordance with the specifications including all operating, monitoring, and shutdown functions. Testing shall also demonstrate that the performance of the system is stable and not subject to hunting, over-adjustments, and cycling of components.

D. Pre-Operational & Functional Testing

1. Comply with Section 01 81 00 – 3.02 & 3.03.

2. If, in the opinion of the Owner, the system meets the requirements specified herein, the system will advance to performance testing. If, in the opinion of the Owner, the pre-operational and functional test results do not meet the requirements specified herein, the system will be classed as nonconforming.

3. In the case of a nonconforming system, advancement to subsequent testing and monitoring will not commence until the system is classed as conforming. The dewatering equipment Supplier's representative shall make, at no additional cost to the Owner, such adjustments, changes, and/or additions as are necessary to correct the system and retest it as specified above until, in the opinion of the Owner, the system has conformed to these Specification.

E. Performance Testing

1. The screw press equipment Supplier's representative shall start up and operate the dewatering system continuously for two (2) eight-hour day shifts to demonstrate compliance with the performance requirements in paragraph 2.03.

#29: See FKC proposal pages provided with bid form. FKC can demonstrate min and max hydraulic loading rates as long as the given inlet consistency does not cause the average solids loading rate to be exceeded. Inversely, FKC can demonstrate the average solids loading rate as long as the given inlet consistency does not cause the max hydraulic rate to be exceeded.

2. Performance must be demonstrated at the minimum and maximum solids and hydraulic loading rates specified in paragraph 2.03.

3. ☑ Supplier shall be responsible for selecting and providing polymer used throughout the performance testing and demonstration. These activities shall comply with the following:

   a. Select one or more initial polymers based on bench scale testing specified in paragraph 1.05.E.

   b. Select initial polymer(s) based on sludge samples taken no more than one (1) month prior to the demonstration period.

   c. Selected polymer(s) shall be commercially available from more than one vendor.

   d. Inappropriate polymer selection(s) shall not relieve the Supplier from complying with performance or demonstration period requirements.

#30: FKC will only supply one tote (275 gallons) of polymer. FKC estimates the use of 135 gallons for all the startup and testing of the FKC equipment.

   e. Supplier shall provide all polymer required to operate the screw press dewatering system until the Supplier has been notified of the official acceptance of the dewatering system. Supplier shall provide to the Owner contact information for the polymer vendor(s) which provide the polymer(s) used during the performance and demonstration periods.

4. ☑ Supplier shall endeavor to optimize polymer consumption for the dewatering equipment. Upon achieving the specified performance requirements during the two-day performance test specified above, Supplier's representative shall vary the polymer dose between 80% and 120% of the dose used for the successful two-day performance test, in increments of 10%, and provide to the Owner a written summary of the resulting dewatering performance parameters, including cake solids concentration and solids capture percentages

5. ☑ Contractor shall coordinate with the Owner to ensure that there is a sufficient volume of sludge stored in the aerobic digester to provide feed stock for the performance testing and the demonstration period specified in Paragraph 3.08.F.

F. Demonstration Period.

#31: FKC scope and pricing offered does not include demonstration period on-sites services or sample testing or analysis. This service can be provided at an added rate of $1,200 per 8-hour weekday on-site.

1. Following the successful two-day operational test as specified above, the screw press equipment Supplier's representative shall conduct the demonstration period testing specified in this Section.

2. Operate facility for four (4) eight-hour day shifts within a period of two (2) calendar weeks with plant personnel present. The system must operate under automatic controls continuously and meet the performance requirements specified in Paragraph 2.03 at all times during the test. Operator interface or adjustments must not exceed once per hour.

3. During the demonstration period, collect samples for cake solids and capture analysis after each two-hour period of operation.

See FKC comment #31 on previous page.

4. Following the demonstration period, produce a report of the test results. For each sample, list the following:
   a. Date
   b. Time
   c. Sludge feed rate (gpm)
   d. Sludge feed concentration (%)
   e. Polymer feed rate (lb/dry ton)
   f. Cake solids (%)
   g. Capture rate (%)
5. The Supplier shall be responsible for all aspects of sampling and analysis during the demonstration period.
6. At the conclusion of one of the day shifts described above, the dewatering system must be shut down automatically after a two (2) hour time delay. Automatic shutdown operations must include a washdown cycle (mandatory) and the expulsion of thin and dewatered sludge inside the screw press (if required by Supplier's typical operation). No operator interface or adjustments may be made during the programmed time delay or during the automatic shutdown operations.

See FKC comment #29 on previous pages.

7. For a continuous 4-hour period, the facility must operate at the specified maximum solids loading rate or hydraulic loading rate, whichever is limiting, while producing a minimum average sludge concentration of 15 percent and a minimum average capture rate of 95% or maximum filtrate solids of 750 mg/L TSS, as reflected in the performance requirements listed. No operator interface or adjustments may be made during this period.

See FKC comment #31 on previous page.

8. The above requirements must be met using 100% feed sludge from the subject facilities without any sludge conditioning or other supplemental additions, other than the polymer indicated.

G. ☑ If, in the opinion of the Owner, the system meets the performance requirements specified herein during the testing specified above, the Owner will notify the Supplier of the official acceptance of the dewatering system.

☑ H. If, in the opinion of the Owner, the system does not meet the performance requirements specified herein during the testing specified above, the Owner shall notify the Supplier in writing of the nonacceptable performance.

1. In the case of nonacceptable performance, the Supplier shall then have 45 days in which to perform at the Suppliers' expense, any supplemental testing, equipment adjustments, changes or additions and request an additional retest of the nonacceptable system.
2. Time required by the Supplier to perform such measures shall not relieve the Contractor from compliance with the completion times specified in Section 00510 (Construction Agreement).

3.08 MANUFACTURER FIELD SERVICES

#32: FKC scope and pricing is based on the one day of training occurring during the same trip as functional testing, and one day of training occurring during the same trip as performance testing.

A. ☑ Provide field inspection and instruction services by a factory trained service representative of the manufacturer. Services by a sales representative are not acceptable.

1. Provide a minimum of two visits, each of a three-day duration, 8-hour minimum work hours per day, travel time excluded, for assistance during installation, equipment startup and testing.

2. Submit a Manufacturer's Certificate of Installation (Section 01 99 00).

B. Provide a minimum of 8 hours over two days, excluding travel time, to train plant operators.

1. Comply with Section 01 79 00.

2. Conduct training sessions for Owner's staff in the proper operation and maintenance of the equipment, including all instrumentation and controls.

3. Conduct training during the latter portion of the functional testing when the equipment is fully operational and before the equipment's Demonstration Period.

☑ 4. Include orientation of the Owner's staff to the operation and maintenance information provided by the Equipment Supplier.

#33: FKC scope and pricing does not include complete disassembly and re-assembly of all major parts and components of one screw press unit. FKC will instruct, both in the classroom and in the field, how to perform all preventative and corrective maintenance procedures to the owner's satisfaction.

5. Include a complete disassembly and re-assembly of all major parts and components of one screw press unit.

6. Submit a Manufacturers Instruction Certification Form. (Section 01 99 00).

C. ☑ Make additional site visits as required to comply with these specifications at no additional cost to the Owner.

END OF SECTION

☑ Checkmark signifies FKC compliance with specification. A hashtag with a number (Example: #1) shows an FKC clarification or exception with description provided.

SECTION 41 12 13

SHAFTLESS SCREW CONVEYORS

☑ **PART 1 - GENERAL**

☑ 1.01 SECTION INCLUDES

☑ A. Description

1. Shaftless screw conveyors and associated appurtenances for the transport of dewatered biosolids.

☑ B. Equipment Numbers

1. Inclined Conveyor: Tag No. CON-250-03
2. Horizontal Conveyor: Tag No. CON-250-04

☑ 1.02 REFERENCED SECTIONS

☑ A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals
2. Section 01 66 00 – Materials and Equipment
3. Section 01 78 23 – Operation and Maintenance Data
4. Section 01 79 00 – Training
5. Section 01 81 00 – Equipment and System Testing
6. Section 01 99 00 – Reference Forms
7. Section 05 50 01 – Anchor Bolts and Anchoring Devices
8. Section 09 96 00 – High Performance Coatings
9. Section 11 05 13 – Electric Motors
10. Section 46 05 13 – General Requirement for Equipment
11. Section 46 05 14– Equipment Mounting
12. Section 46 76 27 – Screw Press Dewatering Equipment

☑ 1.03 SUBMITTALS

☑ A. Comply with Section 01 33 00 and submit the following.

☑ B. General arrangement drawings showing the entire assembly. Include a materials list and descriptions of all major components such as all gears and support structure.

☑ C. Descriptive literature and/or catalogs of the equipment, including a detailed equipment specification.

☑ D. A list of at least 20 installations of similar size that have been operating successfully for at least five years in municipal wastewater treatment plants.

E. Spiral strength calculations for spring (spiral) compression and elongation.

F. Conveyor torque calculations stamped by a registered engineer.

G. Torque calculations for the gear reducer and reducer motor.

H. Motor data submittal in accordance with Section 11 05 13.

I. Equipment mounting submittal information specified in Section 46 05 14.

J. Anchor bolt design calculations and details in accordance with Section 05 50 01.

K. Applicable operation and maintenance information specified in Section 01 78 23.

L. Complete and submit the following forms from Section 01 99 00:

1. Motor Data Form.
2. Unit Responsibility Form.
3. Additional forms required during startup per Part 3.

1.04 QUALITY ASSURANCE

A. Unit Responsibility

1. Provide unit responsibility for the equipment included in this section.

B. Coordination

1. Coordinate the shaftless screw conveyor design and installation requirements with the biosolids dewatering equipment manufacturer.

C. Experience

1. A minimum of not less than 10 years experience in the design and manufacture of shaftless screw conveyor systems.
2. At least 20 shaftless screw conveyor systems operating successfully for at least five (5) years at municipal wastewater treatment plants.

1.05 PRODUCT SHIPMENT, PROTECTION, AND STORAGE

A. Comply with Section 01 66 00.

B. Site Storage and Handling of Equipment.

1. Store the supplied equipment in accordance with the manufacturer's recommendations and instruction.
2. Store gear reducers and motors in buildings or trailers which have concrete or wooden floor, a roof and fully enclosed walls, and will protect the equipment from dust, dirt, and moisture.
3. Take responsibility for work, equipment, and materials until inspected, tested and finally accepted.

1.06 PROJECT CONDITIONS

A. Install equipment in an outdoor, canopy covered location at the biosolids dewatering facility, as shown on the Drawings. The majority of the inclined conveyor will not be covered by a canopy and will be continuously exposed to the elements.

1.07 WARRANTY

A. Warranty Against Wear

1. Warrant the liner and spiral against excessive wear for a period of three years following plant start-up.

2. Liner:

   a. Excessive wear is indicated by the appearance of the bottom indicator layer (second color) along more than 30 percent of the conveyor length.

   b. If excessive wear occurs within the warranty period, provide new formed and banded liner to replace all the liner in the conveyor that has excessive wear.

3. Screw

   a. Excessive wear is indicated by loss of more than 50 percent of the height of the main outer screw section over 30 percent of the screw length.

   b. If excessive wear occurs within the warranty period, provide new screw to replace the screw in the conveyor that has excessive wear.

4. Complete the Extended Warranty Form in Section 01 99 00. Modify the Extended Warranty Form to apply just for the warranty against wear specified above.

1.08 PERFORMANCE REQUIREMENTS

Performance Requirement	Value
Design Capacity of Inclined Conveyor, cubic feet/hour	100
Design Capacity of Horizontal Conveyor, cubic feet/hour	100

(1) Size the conveyor trough the future condition. Design the motor to meet the design capacity. Provide the capability to replace the motor and reducer to meet the future capacity requirements of the horizontal conveyor.

1.09 DESIGN REQUIREMENTS

A. Provide shaftless screw conveyor. Screw conveyor with shaft and intermediate hangers are not acceptable.

B. Design motor and gear reducer to be removable without disassembly of conveyor.

#60 FKC scope and pricing is for a BHX-800 screw whose design requires conveyors for 70 cubic feet hour per CEMA calcuation standards. Conveyors are sized for 70 cu. ft. / hr.

☑ C. Design requirements for the inclined conveyor are as follows:

#61 FKC design is per CEMA calculation standards. The following applies: density 55 lbs/ ft3, 26 rpm, 35% max trough fill rate.

Inclined Conveyor Design Requirement	Value
Material conveyed	Dewatered Digested Sludge
Approx. density of sludge, lbs/ft³	70
Maximum screw speed, rpm	20
Maximum trough fill rate @ design load, %	45
Approx. length, ft. (centerline of dewatered cake discharge chute to centerline of furthest conveyor discharge chute)	22'-5"(1)
Number of inlets	1
Feed inlet from	Screw Press Discharge Box
No. of discharges	2
Discharge to	Horizontal Conveyor
Discharge through	Discharge Chute
Discharge type	Axial
Location of drive	Pulling
Angle, degrees from horizontal	23
(1) Verify dimensions with drawings.	

#71 No drawings to verify dimensions. FKC scope and price is for 22'–5" (linear feet of actual conveyor) length conveyor.

☑ D. Design requirements for the horizontal conveyor are as follows:

#62 FKC design is per CEMA calculation standards. The following applies: density 55 lbs/ ft3, 26 rpm, 35% max trough fill rate.

Inclined Conveyor Design Requirement	Value
Material conveyed	Dewatered Digested Sludge
Approx. density of sludge, lbs/ft³	70
Maximum screw speed, rpm	20
Maximum trough fill rate @ design load, %	45
Approx. length, ft. (centerline of inlet chute to centerline of discharge chute)	9'-4"
Number of inlets	1
Feed inlet from	Inclined Conveyor Discharge Chute
No. of discharges	1
Discharge to	Dumpster
Discharge through	Discharge Chute
Discharge type	Axial
Location of drive	Pulling
(2) Verify dimensions with drawings.	

#72 No drawings to verify dimensions. FKC scope and price is for 9'–4" (linear feet of actual conveyor) length conveyor.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. One of the following:

1. FKC Co. Ltd.
2. Or equal, as defined in Section 01300

2.02 MATERIALS

A. Table 1: Conveyor Component Material Requirements

Component	Material
Chutes, Troughs, End Plates, Covers, Supports	Type 304 stainless steel
Drive Shaft	1045 Steel
Spiral Flighting	Special Chrome-Alloy Steel w/min 225 Brinnell Hardness
Wear Liner	UHMW Polyethylene(1)
Anchor bolts and other fastening hardware	ANSI, Type 304 stainless steel
(1) See Table 2 for specific material properties for the wear liner.	

B. Table 2: Wear Liner Material Properties

Property	Value/Unit	Testing Method
Density	61.2 lbs/ft^3	DIN53479
Molecular Weight	9.2 x 10^6	Margolies
Ball Indentation Hardness	5,946 lbs/in^2	DIN53456
Shore Hardness D	64	DIN53505
Crystalline Melting Range	278°F	
Dynamic Coefficient of Friction	0.1-0.12 ratio of tension/load	Plastic to Steel

2.03 FABRICATION

A. Minimum thickness for steel items

1. Trough lids: 10 gauge.
2. All other components: 10 gauge.

B. Shop welding

1. Comply with Structural Welding code, AWS D1.1, of the American Welding Society.
2. For all welded connections, develop the full strength of the connected elements.

2.04 MECHANICAL COMPONENTS

A. Spiral Flighting

1. Spiral flighting designed to convey material without a center shaft or hanger bearings.
2. Construct spiral flights of cold-formed high strength chrome alloy steel with a minimum hardness of 220 Brinnell. Provide spiral flights with adequate stability to prevent distortion and jumping in the trough.
3. Provide a second, inner spiral, concentric with the outside spiral.
4. Provide the auger flighting with a torsional rating that exceeds the torque rating of the drive motor at 150% of its nameplate horsepower.
5. Limit the "spring effect" of the spiral to 1.0 mm per 100 mm of length at maximum load conditions.
6. Provide a minimum outer spiral thickness of 0.75 inches for spiral diameters up to 9 inches and 1 inch for spirals diameters exceeding 9 inches.
7. Form the spiral flighting in sections from one continuous flat bar that is concentric within a tolerance of 2 mm. Sectional flighting formed from plate is not permitted.
8. Provide full penetration welds at all splice connections.
9. Couple the spiral flights to the end shaft by a flanged, bolted connection.

#63 Per CEMA design standards, coupling of spiral flight to the end shaft is by a solid shaft with tube coupling and cross bolts.

B. Drive System

1. SEW Eurodrive FAF enhanced screw conveyor drive with four individual sealing areas.
2. Or equal

C. Horizontal and Inclined Troughs

1. Provide U-shaped troughs.
2. Provide inclined conveyor with a 2-inch flanged drain outlet to facilitate cleaning. Pipe the drain outlet to the drain as shown on the drawings. Provide drains with 1-inch flushing connections.
3. Equip the inclined trough with an inlet opening to interconnect with the screw press dewatering unit. Coordinate the opening size with the screw press manufacturer. Flange the openings to provide for a suitable interconnection between the two pieces of equipment.
4. Provide bolted covers on all portions of each trough that is not covered by the filling chutes. Provide covers with a maximum five (5) foot length. To prevent unsafe access to the conveyors, quick opening covers will not be allowed unless they are also bolted to prevent access during operation. Provide each conveyor with the appropriate warning labels to call for lock out – tag out of the electrical system before the covers are removed. Provide one inspection hatch with finger guards on each of the two conveyors.

☑ D. Wear Liner

1. Line the inside trough surfaces of the conveyors with a layer of ultra high molecular weight polyethylene (UHMW-PE). Provide liner by SPIRAC Duraflo SPX, or Xylethon by Durawear, Polystone M or equal.
2. Provide a single piece liner that is formed and bonded with two (2) layers of the same material, each of a different color, to provide a visible indication when the liner is nearing the end of its useful life.
3. Single color liner is acceptable if manufacturer provides ultrasonic thickener tester for testing liner thickness (Yanmis Thickens Gauge, GM100, ½-220 mm digital thickness tester or equal).
4. Provide liner sections that are a maximum length of four (4) feet.
5. Provide stainless steel clips to hold the liner in place. Fasteners are not allowed.
6. Provide a liner with a minimum thickness of 1/2" for spirals up to 14" diameter and a minimum thickness of 5/8" for larger spirals.
7. Proprietary hold-down guide liners mounted under the lids are acceptable as long as they do not interfere with the flow of sludge. Steel hold down bars are prohibited.

☑ E. Conveyor Supports

1. Provide conveyor with supports suitable for mounting conveyors as shown on the drawings.
2. At a minimum, provide the inclined conveyor with supports at the inlet end and at the storage facility wall, with intermediate supports as required.
3. Provide Type 304 stainless steel structural angle supports with a thickness of minimum 0.25".
4. Shop fabricate supports from structural steel shapes and plates. Assemble and fit supports to the conveyor prior to delivery to the jobsite. Match mark supports and conveyor segments for easy Contractor installation.
5. Allow for 1-1/2 inch of grout beneath each support foot pad for the Contractor to compensate for uneven floor elevation.
6. Coordinate with dewatering equipment manufacturer to ensure that the supports avoid interference with other equipment or equipment supports.

☑ F. Drive Units

1. Provide each spiral conveyor with a constant-speed gear reducer motor drive unit. Mount the drive unit to a bellhousing adapter flange that is mounted to the end plate of the conveyor.
2. Design the adapter flange to allow the leakage from inside the conveyor trough to atmosphere rather than into the gear reducer/motor drive unit. Direct coupling of the gear reducer/motor drive unit to the end flange of the conveyor is not acceptable.

3. Design the drive unit to be rigidly supported to prevent any visible vibration.

4. Design the drive system to start the conveyor with the trough filled at two times the design load for loads designed up to 67 percent fill rate, and 1.5 times for loads designed exceeding 67 percent fill rate.

☑ G. Motors

1. Comply with Section 11 05 13, except as modified herein.

2. Type 2, constant speed.

3. Motor Sizes:

   a. Inclined conveyor: maximum 5.0 horsepower

4. Power Requirements: 480 volt, 3-phase, 60 Hertz.

5. Minimum Service Factor: 1.15

6. Nominal Speed: maximum 1,800 rpm

☑ H. Gear Reducers

1. Provide AGMA Class II gears with single or double reduction.

2. Provide helical gear units with high capacity roller bearings. Design bearings with thrust loads for a fully loaded startup condition.

3. Provide bearings with an ABMA L-10 life of 100,000 hours.

4. Design the reducer to be air-cooled with no auxiliary cooling requirement.

5. Size the gear reducer with a torque service factor of 1.5 times the absorbed power or 1.1 times the motor nameplate (at the driven shaft speed), whichever is greater.

☑ I. Chutes and Discharge Boots

1. Furnish inlet and discharge chutes of the same gauge and construction material as the conveyor troughs, at locations as shown on the drawings. Provide minimum 10 gauge thick flanges.

2. Furnish single-ply flanged discharge boots at locations and lengths shown on the drawings. Construct flexible boots of EPDM rubber hose, neoprene, Linatrile by Linatex Corporation, or approved equal.

☑ J. Electrical Equipment

1. Provide electrical equipment that conforms to the applicable standard of the National Electrical Manufactures Association (NEMA) and the National Electrical Code (NEC).

2. Motion Failure Alarm Unit

   a. Provide an external conveyor mounted motion failure alarm, (alternately known as "zero speed" or "under-speed" switch) to detect spiral or drive shaft failure (one for each conveyor). Provide with a NEMA 4 enclosure.

   b. Switch shall interface to the plant control system with 120 VAC rated dry contact or 120 VAC pulse output proximity switch.

3. Emergency Shutdown:

#64 FKC scope and pricing includes Omron 3022 emergency trip cords and safety switches.

a. Provide an emergency trip cord and safety switch for each conveyor and for the motorized pivot mechanism. Run the cord the full length of each conveyor. Design the trip switch to immediately stop all conveyors and the motorized pivot mechanism when the switch is actuated. The switch shall be RS type by Conveyor Components Corporation or approved equal.

4. Electrical Controls

a. Except as specified above, electrical controls for the shaftless conveying equipment furnished under this section will be provided by others, as part of the control panel(s) for the screw press dewatering equipment being furnished under Section 46 76 27.

2.05 ACCESSORIES

#65 FKC scope and pricing provides anchor bolt Structural PE Oregon calculations for conveyors, but does not include anchor bolts. Anchor bolts to be provided by others.

A. Anchor Bolts

1. Comply with Section 05 50 01.
2. Calculations are required.
3. Minimum diameter: 1/2".

B. Spare Parts

#68 FKC scope and pricing does not have any spare packing gland sets.

1. One (1) packing gland set, for each conveyor supplied
2. Comply with Section 46 05 13.

C. Lubricants

1. Furnish lubricants of the type and quantity as recommended by the conveyor manufacturer for (start-up) operation.

2.06 FACTORY COATING

A. Furnish gear reducers and motors with the manufacturer's standard paint system.

B. Stainless Steel

1. Clean with mild abrasive wheels and/or nonferrous blast media to remove heavy scale and welding carbon. It is also acceptable to passivate with stainless steel cleaner and then rinse.

C. Iron and Mild Steel

1. Dry abrasive blast all iron and mild steel in accordance with SSPC-SP6 and Section 09 96 00. Paint surfaces within 24 hours to prevent rusting and surface discoloration.
2. Paint surfaces per Section 09 96 00 (with exception of spiral).
3. Provide spiral with one coat of shop primer.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Align, connect, and install equipment in accordance with the manufacturer's written instructions.

B. Ensure true alignment of spiral flights during installation.

C. Trial fit and match-mark mating parts in the factory to ensure field assembly is possible.

D. Provide factory-trained personnel to check installation and test initial operation.

E. Certify installation and initial operation of all components on the appropriate forms included in Section 01 99 00.

3.02 FIELD QUALITY CONTROL

A. Field quality control and inspections will be performed as specified in Section 01 81 00.

B. Corrective Actions: Replace or repair work to eliminate defects, deficiencies and irregularities.

3.03 MANUFACTURER'S FIELD SERVICES

A. Provide field inspection and instruction services by factory-trained service technician of the manufacturer as specified in Sections 01 79 00 and 01 81 00. Services by a sales representative are not acceptable.

1. Provide minimum 1 visit of 8 hours, excluding travel time, to inspect and test initial operation.

2. Provide minimum1 visit of 4 hours, excluding travel time, to train plant operators.

B. Submit completed Manufacturer's Installation Certifications (Section 01 99 00).

C. Submit Manufacturer's Instruction Certification (Section 01 99 00).

#69: FKC conveyor training will be part of overall screw press dewatering training.

3.04 PERFORMANCE TESTING

A. Comply with Section 01 81 00.

B. Torque Testing

1. Operate conveyor under full load to ensure that torque design requirements are met.

3.05 DEMONSTRATION

A. Comply with Section 01 81 00.

#70: FKC scope and pricing offered does not include demonstration period on-sites services or sample testing or analysis. This service can be provided at an added rate of $1,200 per 8-hour weekday on-site.

END OF SECTION

Checkmark signifies FKC compliance with specification. A hashtag with a number (Example: #1) shows an FKC clarification or exception with description provided.

#34: The intent of FKC markups for the polymer blending unit is to provide the Velodyne standard model VM-5P-1200-D-0-A-1. The markups should reflect this Velodyne standard. Any deviation in the FKC markups or omissions is superceded by the Velodyne standard model VM-5P-1200-D-0-A-1.

SECTION 46 33 33

POLYMER BLENDING UNITS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements for a polymer blending and feed system to provide prepared polymer solution from a concentrated raw polymer supply.

B. If required to meet the Project schedule, the polymer blending unit manufacturer may propose alternative components for consideration during bidding. The alternative components must be equal in quality and function to the components included in this specification. Alternative components must also be industry standard components and components that are typically used by the manufacturer.

C. Equipment List

Location	Equipment No.
Biosolids Mechanical Dewatering Facility	POL-250-06

1.02 REFERENCED SECTIONS

A. The following Sections are referenced in this Section:

1. Section 01 33 00 – Submittals
2. Section 01 66 00 – Materials and Equipment
3. Section 01 78 23 – Operation and Maintenance Data
4. Section 01 81 00 – Equipment Startup and Testing
5. Section 01 99 00 – Reference Forms
6. Section 05 50 01 – Anchor Bolts and Anchoring Devices
7. Section 09 96 00 – High Performance Coatings
8. Section 11 05 13 – Electric Motors
9. Section 46 05 13 – General Requirements for Equipment
10. Section 46 05 14 – Equipment Mounting
11. Section 46 76 27 – Screw Press Dewatering Equipment

1.03 COORDINATION

A. Provide POL-250-06 to the dewatering equipment manufacturer for inclusion in the biosolids mechanical dewatering polymer system.

B. Verify requirements for POL-250-06 with the dewatering equipment manufacturer.

1.04 DESIGN REQUIREMENTS

A. Criteria

1. Provide an integrated equipment package designed to automatically meter, activate, dilute with water, and feed high molecular weight liquid polymer.
2. Include: Mounting skid, neat polymer metering pump, mixing chamber, booster pump (if required by this specification), piping and fittings, integral control panel, connections to automatic controls, and all necessary appurtenances required for proper and efficient operation.
3. Design unit to discriminately apply high mixing energy to maximize polymer activation while preventing polymer jelling, agglomeration or damage to its molecular structure.
4. Design mixing chamber to maximize the dilution and dynamic activation of liquid polymer. Not acceptable: conventional static mixers or mixing blocks for primary polymer dilution or activation.
5. Do not expose polymer to a centrifugal pump impeller or other cause of excessive shear.
6. Provide progressing cavity polymer metering pump to convey concentrated polymer to mixing chamber.
7. Design all components which require periodic maintenance to be readily accessible.
8. Design unit for working pressure of 100 psi, except as noted below.
9. Electrical Equipment
    a. Comply with standards or requirements of National Electrical Manufacturer Association (NEMA) and National Electrical Code (NEC).
    b. Insulate both power and control equipment for 600V even though operating voltage may be lower.
10. Mount all components securely on a single Type 304 stainless steel frame.
11. Plant Water Supply
    a. Water for cleaning sprays and polymer blending will be plant effluent (UW) filtered through a tertiary disk filter with nominal 10-micron opening and that may contain small quantities of biological floc and dilute concentrations of industrial solvents.
    b. If additional filtration is required, provide a strainer at the water connection point.
12. The water pressure as it enters the dewatering building is expected to range from 60 to 80 lbs/in^2.
13. If additional pressure is required, provide a booster pump system to meet the pressure needs of the screw press system.

B. Performance

1. Conform to the following:

Equipment No.	POL-250-06
Dilution water capacity, gph	60 - 600
Polymer viscosity, centipoise	< 5,000
Diluted polymer concentration, percent	0.3 – 0.7
Downstream dilution required	No
Polymer feed pump	
Discharge capacity, required range, gph	0.25 – 5.0
Maximum discharge pressure, psig	65
Functional turndown range, minimum	20:1

#35: Due to delivery times the unit will be provided with 120–1200 gph of dilution water capacity.

1.05 SUBMITTALS

A. Comply with Section 01 33 00.

B. Include a copy of the contract document control diagrams and process and instrumentation diagrams, with addenda updates, that apply to the equipment in this section.

1. Mark to show specific changes necessary for the equipment proposed in the submittal.
2. If no changes are required, mark the drawing or drawings "No Changes Required".
3. Failure to comply with this paragraph is sufficient cause to reject the entire submittal.

#36: Markups on drawings I–251, I–252, and I–253 will be provided, but Velodyne standard polymer system will be supplied.

C. Include the following items:

1. Complete equipment list, identifying all electrically powered equipment including pumps, powered valves, and motors, process control instruments, equipment safety instruments and switches, and motor starters.
2. Wiring and connection diagrams indicating all electrical connections.
3. Motor submittal information as specified in Section 11 05 13.
4. Equipment mounting submittal information specified in Section 46 05 14.
   a. Applicable operating and maintenance information specified in Section 01 78 23.
   b. Complete and submit the following forms from Section 01 99 00.
      1) Motor Data Form.
      2) Unit Responsibility Form.
      3) Additional forms required during startup per PART 3.

#37: Motor and equipment mounting submittal information will be provided, but Velodyne standard motors and equipment mounting will be supplied.

1.06 QUALITY ASSURANCE

A. Unit Responsibility

1. Assign unit responsibility as specified in Section 46 05 13 to the screw press dewatering equipment manufacturer for the equipment specified in this section.

1.07 SHIPMENT, PROTECTION AND STORAGE

A. Comply with Section 01 66 00.

1.08 ENVIRONMENTAL CONDITIONS

A. The equipment will be installed in a weather-exposed outdoor location covered by a canopy.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Dyna Blend as manufactured by Fluid Dynamics, Inc.

B. Polyblend as manufactured by UGSI ChemFeed.

C. VeloDyne as manufactured by Velocity Dynamics.

D. Or equal as specified in Section 01 33 00.

E. Modify equipment as required to meet the requirements of this section.

F. Coordinate with dewatering equipment manufacturer.

2.02 MATERIALS

A. Mounting Frame: Type 304 stainless steel

B. Mixing Chamber: Type 304 stainless steel or PVC/acrylic

C. Fasteners: Type 304 stainless steel.

D. Control Panel: Type 304 stainless steel.

#38: FKC to provide 18-8 stainless steel fasteners.

#39: FKC to provide NEMA 4X Velodyne standard FRP control panel enclosure.

2.03 PIPING CONNECTIONS

A. Dilution water inlet, 1.0" FNPT

B. Neat polymer inlet, 1" NPT

C. Polymer solution discharge, 1.0" FNPT

2.04 EQUIPMENT COMPONENTS

A. Hydrodynamic Mixing Chamber – Fluid Dynamics

1. Produce high fluid shear conditions without use of internal mechanical mixing systems. Employ hydrodynamic action to combine the polymer and dilution water.

2. Stage mixing energy to provide for high, non-damaging mixing energy over the full operating range of the system which then dissipates through concentric chambers.

3. Provide an integral, multi-stage, stainless steel dilution water booster pump with pressure regulating valve capable of producing a minimum 50 psi differential pressure across the water control orifice. Systems that rely on dilution water

distribution system pressure and flow alone to create mixing energy shall not be acceptable.

4. Provide an integral water control device to also produce mixing energy by creating a pressure drop across its orifice. Configure to allow orifice replacement without disassembly of any other part of the system.

5. Provide drain valve with 1/2" fitting.

B. Motorized Mixing Chamber – UGSI ChemFeed

1. Mix polymer and water in a chamber designed to create sufficient mixing energy.

   a. Provide a motor-driven impeller that will create high fluid shear for mixing polymer and water.

   b. Taper mixing intensity as solution exits the initial shear zone and passes through a second zone, isolated by a baffle.

   c. Design so polymer activation efficiency is consistent over the dilution water range.

2. Motor

   a. Comply with Section 11 05 13.

   b. Size: 1 HP maximum.

   c. Constant speed, washdown duty motor.

   d. Nominal Maximum speed: 3,450 rpm.

   e. Direct-coupled to impeller shaft.

☑ C. Hydro-Mechanical Mixing Chamber – Velodyne

☑ 1. Mixing Chamber

   a. Capable of operating on source water pressure alone at 30 psi differential pressure, or independently of plant water pressure through a motor-driven stainless steel mechanical mixer. Design mixing impeller to produce both axial and radial flow and to induce high, non-damaging mixing energy over the full flow range.

#40: Velodyne standard seal flush hardware will be provided without a valve.

   b. Mixer drive shaft: sealed by a mechanical seal with an integrally mounted and factory plumbed seal flushing valve. Provide a drain port in the mixing chamber to drain polymer solution in case of seal failure. The seal shall be easily accessible for replacement.

   c. Bearings: external to the mixing chamber.

☑ 2. Motor

#41: Velodyne standard motors will be supplied.

   a. Comply with Section 11 05 13.

   b. Wash-down duty

   c. Speed: Variable. Provide SCR motor controller.

   d. Size: 1 HP maximum

   e. Nominal maximum speed: 1,750 rpm

   f. Direct-coupled to impeller shaft

   g. Provide mechanical shaft seal flushing gland

☑ D. Mixing Chamber Pressure Relief Valve

#42: Velodyne standard 1/2" brass PRV will be supplied.

1. Range: 25 to 65 psi.
2. Stainless steel body with stainless steel, Viton and Teflon internals.

☑ E. Neat polymer check valve

1. Design to isolate neat polymer from dilution water.
2. Design with an open, unobstructed path to the valve seat.
3. Valve body: Teflon or stainless steel.
4. Seals: Viton
5. Ball and spring: Stainless steel.
6. Make valve readily accessible for cleaning and easily disassembled.
7. Check valves that are installed inside the mixing chamber, or which require mixing chamber disassembly for servicing are not acceptable.

☑ F. Pressure gauges:

1. Use to monitor the dilution water inlet and diluted polymer solution pressures.
2. Liquid filled and of stainless steel construction.
3. Size: 2-1/2" face
4. Range:
   a. Dilution Water: 0-100 psig
   b. Diluted Polymer Solution: 0-60 psig

#43: To be supplied by FKC: Velodyne standard stainless steel/ brass construction with 0–160 psi range.

☑ G. Dilution Water Control

1. Flow measurement: Rotameter-type flow meter or electronic flow sensor
   a. Range: 0-10 gpm.
   b. Provide unions on the inlet and outlet to allow easy removal for cleaning.
   c. Metering tube: Cast acrylic
   d. Internal components: Type 316 stainless steel
   e. Fittings: PVC

#44: To be supplied by FKC: Velodyne standard range 0–20 gpm.

2. Flow control: Provide flow control valve
3. Pressure reducing valve:
   a. Provide stainless steel body PRV in dilution water line
   b. Minimum output pressure range: 25 - 75 psig.
4. Loss-of-flow indication: Differential pressure switch.
   a. Set to sense loss of dilution water flow.
   b. Static working pressure: minimum 150 psi
   c. Rating: NEMA 4X.
   d. On loss of dilution water flow, place metering pump on standby; restart automatically when flow is restored.

#45: To be supplied by FKC: McMaster Carr #45805K824 PRV 1–inch quick set, stainless steel body, EPDM diaphragm & seal, threaded (F)NPT connections, 20 to 90 psi, 5 psi incremental change by dial.

5. Provide electric solenoid valve for on/off control of total dilution water flow:
   a. Body: Stainless steel or brass
   b. Rating: NEMA 4X.
   c. Power: 120VAC
   d. ASCO RedHat 8210G or equal.

☑ H. Neat Polymer Metering Pump

1. Pump
   a. Type: Positive displacement, progressing cavity, with 316 SS rotor and Viton stator.
   b. Priming: Do not require the pump to be modified for priming.
   c. Mount directly on skid.
   d. Pump output control: Provide local manual control using a potentiometer, and automatic control in response to a 4-20 mA flow signal.
   e. Power: 120 VAC.
   f. Provide loss-of-flow sensor. On low flow/loss of flow, shut down system and provide local and remote indication of alarm. Pressure switches or mechanical or reed type switches are not acceptable.
   g. Provide a hand vacuum pump for priming.

#46: FKC scope and pricing does NOT include a hand vacuum pump for priming.

2. Motor
   a. Washdown duty.
   b. Direct-couple motor and pump to a gear reducer.
   c. Provide one of the following:
      1) 1/2 HP, 0-90 volt TENV DC motor with variable speed provided by an SCR controller
      2) Type 2 motor per Section 11 05 13, with VFD

#47: See FKC previous comment #41.

☑ I. Skid

1. Construct of 3/16" minimum Type 304 stainless steel angle or structural stainless steel tubing.
2. Do not use mild steel.
3. Sheet metal supporting the control panel: Minimum thickness of 12 gauge.
4. Gusset vertical frame members.
5. Pipe Supports: Stainless steel.
6. Design for forklift.
7. Drill for anchor bolt mounting to concrete pad.
8. Maximum Dimensions
   a. Overall: 48" wide x 36" deep x 70" high.
   b. Mount control panel in vertical position at 60" above pad.

#48: FKC scope and pricing includes the standard skid for Velodyne model VM-5P-1200-D-0-A-1. This includes this model's pipe supports and control panel vertical location, pipe clamps and fasteners.

See FKC previous comment on previous page.

9. Polymer pump suction: do not exceed 18" above pad.

10. Mount piping and valves with rigid pipe clamps. Fasteners required to mount components: Minimum 1/4-20 stainless steel.

☑ 2.05 PROCESS CONTROLS AND INSTRUMENTATION:

☑ A. Require manufacturer to design all electrical components including motor starters, switches, instrument devices, conduit, cable and other miscellaneous components.

☑ B. Control Panel

1. Provide relays, digital displays, switches and status lights for all operating units to indicate control of electrical equipment.

2. Enclosure: NEMA 4X, fiberglass

#49: FKC scope and pricing does not include any items listed in paragraph 2.05.B.3.

3. Equip with a main disconnect switch, lockable in the OFF position and provide with a door interlock feature which prevents the panel front door from being opened unless the disconnect switch is in the OFF position.

4. Operating Mode: Determined by the position of a LOCAL/OFF/REMOTE switch mounted on the control panel.

#50: FKC scope and pricing does not include contacts for confirmation of polymer pump's running status, only contacts for system running status.

5. Provide contacts for confirmation of polymer feed pump's running status.

6. Provide local control:

a. Panel mounted ten-turn potentiometer knob or membrane keypad with increase/decrease push button, for controlling the neat polymer metering pump in LOCAL mode with digital display of polymer pump speed on panel.

b. Internal potentiometer, for controlling the mixing chamber speed.

7. Provide cable, conduit, conductors, and other electrical hardware per electrical specifications.

8. Switches and indicator lights: Allen Bradley series 800F or 800H, NEMA 4X. "Mini" LED indicator lights, toggle switches and residential light switches are not acceptable as control devices or indicators.

9. Provide terminal blocks for all skid mounted electrical components interconnected to control panel. Size for 14 ga. wires with and include terminal block numbers and legend, as manufactured by Entrelec or equal.

10. Use wire raceway and number wires with adhesive labels.

11. Control Devices

#51: FKC scope and pricing does not include any items in paragraph 2.05.B.11.a or 2.05.B.11.d.

a. Fused type door mounted disconnect (required for 480 VAC or greater).

b. LOCAL - OFF - REMOTE switch with contacts to receive remote start/stop signal (dry contact) in "Remote" mode. Unit is manually powered in the "Local" mode.

c. HAND-OFF-AUTO switch for operating mode selection. In AUTO mode, control pump speed via 4-20 mA input signal.

d. Alarm reset Push-Button.

12. Indicators

#52: LCD displays polymer pump flow not speed.

a. LCD display of polymer pump speed.

b. Power ON indicator.

c. Low differential pressure or loss of water alarm.

d. Loss of polymer

13. Alarms

a. Provide Loss of Polymer Flow Alarm, thermal sensor type. Place system on standby when loss of polymer flow occurs, and require manual restart. Provide 0 to 60 second time delay relay to prevent nuisance alarms from occurring.

b. Provide Loss of Water Alarm, differential pressure type. Place system on standby on loss of dilution water, and restart automatically when flow is restored.

14. Inputs (signals by others):

a. Accept 4-20 mA analog input signal to provide automatic polymer pump pacing in "Auto" mode.

b. Accept a run/stop signal (discrete dry contacts) to turn pump on/off in "Remote" mode.

#53: FKC scope and pricing does not include any items listed in paragraph 2.05.B.15.a.

15. Outputs

a. 4-20 mA output proportional to pump speed.

b. System "Running" status output, dry contact.

c. System in "Remote mode" status output, dry contact.

☑ 2.06 ACCESSORIES

A. Anchor Bolts

1. Comply with Section 05 50 01.

2. Calculations are required.

3. Minimum diameter: 1/2"

#67 FKC scope and pricing provides anchor bolt Structural PE Oregon calculations for the polymer blending unit, but does not include anchor bolts. Anchor bolts to be provided by others.

#54: FKC scope and pricing includes Qty (2) polymer tote mixers, McMaster Carr #1155N1 with propellers to fit through standard tote opening. Second folding propellor not included. McMaster Carr standard motor will be provided with standard finish coatings.

B. Polymer Tote Mixers

1. Provide two (2) adjustable bracket-mounted vertical tote mixers:

a. Size for IBC 330-gallon totes.

b. Motor: 1/2-horsepower, 115/230 VAC.

c. Provide 3/4-inch 316 stainless steel shaft.

d. 316 stainless steel propeller shall fold to fit through 2-inch tote opening, and open to 9-inch operating diameter.

e. Provide a second folding propeller for mounting along 3/4-inch shaft.

f. Include adjustable aluminum mounting brackets. Contractor to coordinate with Owner and mixer supplier to ensure appropriate mounting bracket for IBC tote style in use by Owner.

See FKC previous comment on previous page.

g. Include standard 3-prong power cord of sufficient length for the installation as depicted in the Drawings.

h. Manufacturer:

1) Neptune Chemical Pump Co., Inc. Model RGT 1.0, with RGT-BKT mounting bracket.

2) Or equal.

C. Polymer Tote Heating Blankets

#55: BriskHeat supply inventory at time of bid was either out of stock or delayed. If delivery time prohibits use of Briskheat, then FKC will supply McMaster Carr parts #1819N1 and #3571K96 which do not include a built-in manual reset high-limit safety thermostat. McMaster Carr part numbers may also not meet delivery schedule and may arrive late without liquidated damages or penalty.

1. Provide two (2) adjustable tote heating blankets:

a. Size for IBC 330-gallon caged, plastic or metal totes.

b. Voltage: 120 VAC

c. Wattage: 1440 W

d. Provide two heat zones each with an adjustable thermostat: 50-160 degrees Fahrenheit.

e. Provide built-in manual reset high-limit safety thermostat for each heat zone set at 195 degrees Fahrenheit.

f. Attachment method: adjustable nylon straps with plastic or non-ferrous metal buckles.

g. Provide silicone impregnated cloth facing and liner.

h. Insulation: 1/4-inch fiberglass

i. Include opening for tote spigot.

j. Include separate insulated top cover. Top cover shall be removable from remainder of heating blanket to accommodate installation and removal of tote mixers.

k. Include standard 3-prong power cord of sufficient length for the installation as depicted in the Drawings.

l. Manufacturer:

1) BriskHeat.

2) Or equal.

☑ D. Spare Parts

1. Provide 1 set manufacturer's recommended spare parts, including but not limited to the following:

a. Solenoid valve.

b. Neat polymer metering pump mechanical seal and pump stator.

c. Mixing chamber o-rings.

d. Neat polymer check valve.

#56: Motor and gearbox come with factory standard coating. All other non-stainless components (PVC, brass, etc.) do not have factory finish.

☑ E. Comply with Section 46 05 13.

☑ 2.07 FABRICATION

☑ A. Factory assemble each pump, drive, and motor to its common base.

B. Factory finish any non-stainless steel components. Comply with Section 09 96 00.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Align, connect, and install each unit as shown and in accordance with the manufacturer's written instructions.

B. Provide factory-trained personnel to check installation and test initial operation.

C. Certify installation and initial operation of all components using the appropriate forms included in Section 01 99 00.

3.02 FIELD QUALITY CONTROL

A. Field quality control and inspections will be performed as specified in Section 46 76 27 and Section 01 81 00.

B. Corrective Actions: Replace or repair work to eliminate defects, deficiencies and irregularities.

3.03 PERFORMANCE TESTING

A. General:

1. Following installation, field test polymer system per Section 46 76 27 and Section 01 81 00 to demonstrate compliance with performance requirements as specified.
2. Schedule testing 30 days in advance with the Construction Manager.
3. Include operation of new equipment with new control system.
4. Contractor: responsible for all labor, chemical, water, power and other costs associated with polymer system testing.
5. Empty and dry polymer system equipment and piping following successful testing and commissioning of associated control loops, and prior to pumping chemicals.

#57: FKC scope and supply only includes 1 tote of polymer. Chemical, water, power, and other costs are not covered by FKC.

B. Water Tests:

1. Subject polymer system to a field test using water.
2. Test for two hours to demonstrate the mechanical and electrical integrity of the system.
3. Inability to successfully complete clean water tests in three tries because of problems directly caused by the polymer system will be considered cause for the Construction Manager to reject the equipment.

C. Polymer Test:

1. Repeat clean water test using polymer.

#58: Water and polymer tests to occur within functional and/or operational testing in the field.

3.04 MANUFACTURER'S FIELD SERVICES

#59: FKC will be trained agent of manufacturer and polymer system training will be part of overall screw press dewatering training.

A. Provide field inspection and instruction services by factory-trained technician or factor trained authorized agent of the manufacturer as specified in Section 46 76 27 and Section 01 81 00.

1. Provide minimum 1 visit of 8 hours, excluding travel time, to inspect and test initial operation, and make necessary adjustments.

2. Provide minimum 1 visit of 8 hours, excluding travel time, to train plant operators to operate and maintain of equipment items included in this Section.

B. Complete and submit the following forms in Section 01 99 00:

1. Manufacturers Installation Certification.

2. Manufacturers Instruction Certification.

3.05 DEMONSTRATION

A. Comply with Section 46 76 27 and Section 01 81 00.

END OF SECTION

Checkmark signifies FKC compliance with specification. A hashtag with a number (Example: #1) shows an FKC clarification or exception with description provided.

SECTION 40 78 00

PANEL MOUNTED EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Requirements pertaining to the construction and installation of the control panels.

1.02 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. National Electrical Contractors Association (NECA)
2. National Electrical Installation Standard (NEIS)
   a. 5055, Standard of Installation
3. National Fire Protection Association (NFPA)
   a. 70, National Electrical Code (NEC)
   b. 79, Electrical Standard for Industrial Machinery
4. Underwriters Laboratories, Inc. (UL)
   a. 3121-1, Standard for Safety for Process Control Equipment
   b. 508, Industrial Control Equipment
   c. 698A, Standard for Industrial Control Panels Relating to Hazardous (Classified) Locations
5. National Electrical Manufacturer's Association (NEMA)
   a. 250, Enclosures for Electrical Equipment
   b. ICS 1-2000, Industrial Control and Systems General Requirements

1.03 SUBMITTALS

A. Contractor shall submit all the product data in Division 40 at the same time. Piecemeal submittals will be rejected as incomplete.

B. Submittal Format:

1. The product data shall be provided as individual PDFs for each Section, unless otherwise noted for specific items. Each PDF shall be numbered to match the specification Section numbers. Submittals not itemized and labeled as specified will be rejected as incomplete.
2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 260000.A01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.

3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.

4. Submittals in PDF shall include an index, table of contents, or bookmarks with hyperlinks to the associated page of all submitted items. Index shall include each product specified with their corresponding Reference Keynote Number. Electronic submittals not containing a linked index, table of contents, or bookmarks will be rejected as incomplete.

C. Product Data

1. Pursuant to Section 01 33 00 – Submittals.

2. Manufacturer's data including materials of construction, methods of installation and related information for each item specified in PART 2 PRODUCTS.

D. Shop Drawings

1. Dimensional drawings showing the overall length, width, and height of the assembled control panel. Included on these drawings shall be the back panel layout of installed control devices showing part numbers, dimensions, nameplate text, and other details required for a complete assembly. The CONTRACTOR shall obtain the Drawings for the control panel layout and schematic from the ENGINEER. The CONTRACTOR shall modify the Drawings as required for submittal and for as-built documentation. The CONTRACTOR shall not generate their own drawings.

2. For large control panel, physical properties, handling, mounting, shipping break point locations shall be shown in submittal drawings. This shall include total weight, lifting instructions, height, and floor space required.

3. Provide electrical schematic drawings that include: wiring details such as internal and field connection terminal block numbers; shielded wire termination requirements; grounding requirements; and wire colors. Show all required internal and external interlocking. Each drawing shall be circuit specific for the system submitted. No typical schematic drawings shall be submitted.

4. Drawings shall list the equipment number of the box, control panel, or center submitted.

5. Component designations shall match those shown on the Drawings.

6. Complete bills of materials shall be included with submittal.

1.04 QUALITY ASSURANCE

A. Qualifications

1. Equipment provided as part of this section shall be manufactured by a single licensed firm, regularly engaged in the design and manufacture of such equipment for a minimum of five years. The control panels shall have a UL508A listing. Components within control panels shall be listed in a manner consistent with UL508A requirements.

1.05 MAINTENANCE

A. Manufacturer shall provide and list in the bill of materials the following spare parts.

1. One each of all power and control fuses provided in the assembled control panel/ center.

B. Provide Operation and Maintenance Data and Manuals Pursuant to the Contract Documents.

PART 2 - PRODUCTS

2.01 COMPONENTS

A. Stainless Steel, NEMA 4X Enclosures (407800.E01).

1. Enclosures shall be provided as shown on the Drawings.
2. Enclosures shall be provided with accessories as shown on the Drawings and as specified below.
3. Enclosures in damp, wet, corrosive, or outdoor locations shall be: constructed of stainless steel (NEMA 4X) with zinc electroplated (galvanized) steel back-panel; continuous hinged with gasketed doors and screw down clamps.
4. Provide manufacturer supplied swing-out deadfront door within the enclosure.
5. Enclosures in outdoor locations shall be equipped with a hasp and staple for padlocking.
6. Provide Hoffman enclosures, or approved equal.

B. Panel Vents (407800.V01).

1. Panel Vents shall be provided as shown on the Drawings.
2. Provide Hoffman number ANMV3, or approved equal.

C. Enclosure Heater (407800.H17).

1. Enclosure heaters shall be provided as shown on the Drawings.
2. Enclosure heaters shall operate on 115 VAC.
3. Enclosure heaters shall be provided with integral mounted thermostats.
4. For 100W heaters, provide Hoffman model DAH1001A, or approved equal.
5. For 200W heaters, provide Hoffman model DAH2001A, or approved equal.

D. Enclosure Lighting (407800.L01).

1. Enclosure lighting shall be provided as shown on the Drawings.
2. Enclosure lighting shall be LED.
3. Lamp shall be provided by CONTRACTOR.
4. Enclosure lighting shall be operated via a remote door switch.
5. Enclosure lighting shall be 115 VAC powered.
6. Provide Hoffman model LEDA1S35 light with door switch, or approved equal.

#71: Power breaker provided in the FKC scope of supply and pricing will be Allen Bradley or Square D based on availability.

E. Power Circuit Breaker (407800.C02).

1. Power circuit breakers shall be provided as shown on the Drawings.
2. Power circuit breakers shall be current-limiting and designed to interrupt and isolate electrical power to individual power circuits and components deriving power from the enclosure.
3. Power circuit breakers shall be UL489 listed.
4. Power circuit breakers shall have the number of poles as indicated on the Drawings.
5. Power circuit breakers shall have current interruption ratings of 10K RMS symmetrical amperes, minimum, with voltage ratings and current trip ratings as shown on the Drawings.
6. Power circuit breakers shall have fast acting (type "B" trip curve), normal (type "C" trip curve) and high inrush (type "D" trip curve) trip characteristics as dictated by the connected load.
7. Power circuit breakers shall be panel mounted on DIN rail.
8. Power circuit breakers shall include a positively trip-free mechanism that cannot be defeated by holding the handle in the ON position.
9. Power circuit breakers shall be wire connected and include terminal lugs.
10. Provide Eaton Cutler-Hammer type FAZ-NA, or approved equal.

See above comment.

F. Power Circuit Breaker Accessories (407800.C04).

1. Provide busbar for one-pole, two-pole or three-pole circuits when shown on the Drawings. The busbar shall be the same manufacturer as the power circuit breaker. Provide Eaton Cutler-Hammer busbar catalog number Z-SV/UL-16/__-___/_, or approved equal.
2. Provide busbar shroud on all unused terminals. The shroud shall be the same manufacturer as the busbar.
3. Provide Eaton Cutler-Hammer busbar shroud catalog number ZV-BS-UL, or approved equal.
4. Provide a bus connector to supply the power feed to the bus bar as shown on the Drawings. The bus connector shall be the same manufacturer as the busbar.
5. Provide Eaton Cutler-Hammer bus connector catalog number Z-EB/50/UL, or approved equal.

#72: MCPs provided in the FKC scope of supply and pricing will be Allen Bradley MCP..

G. Motor Circuit Protector (407800.C05).

1. Motor circuit protectors shall be provided as shown on the Drawings.
2. Motor circuit protectors shall be energy-limiting and designed to interrupt and isolate electrical power to individual power circuits and components deriving power from the enclosure.
3. Motor circuit protectors shall be UL489 listed.

See above comment.

4. Motor circuit protectors shall have the number of poles as indicated on the Drawings.
5. Motor circuit protectors shall have current interruption ratings of 10K RMS symmetrical amperes, minimum, with voltage ratings and current trip ratings as shown on the Drawings.
6. Motor circuit protectors shall have fast acting, normal and high inrush trip characteristics as dictated by the connected load.
7. Motor circuit protectors shall be panel mounted.
8. Motor circuit protectors shall include a positively trip-free mechanism that cannot be defeated by holding the handle in the ON position.
9. Motor circuit protectors shall be wire connected and include terminal lugs.
10. Provide Cutler-Hammer type HMCP, or approved equal.

#72: Relays provided in the FKC scope of supply and pricing will be 700H–HK series. DPDT based on space availability.

H. Miniature "Ice Cube" Relays (24 VDC) (407800.R05).

1. Provide relays as shown on Drawings.
2. Relays shall be industrial plug-in blade style with the on/off status indicated by either a neon or LED indicating light or by mechanical means.
3. Relays shall be Form C contacts with a minimum of 4 poles and 7-amp contact rating.
4. Relay coil voltage shall be 24VAC.
5. Provide with DIN rail mounting screw terminal socket and retainer clips.
6. Relay bases shall be of the same manufacturer as the relay.
7. Provide Allen-Bradley p/n 700-HC24A24 relays, p/n 700-HN104 screw terminal sockets, and p/n 700-HN114 retainer clips, or approved equal.

I. Time Delay Relays (407800.R12).

1. Time delay relays shall be provided as shown on the Drawings.
2. Time delay relays shall be either time delay on energize (TDOE), or time delay on de-energize (TDODE) as indicated on the Drawings.
3. Time delay relays shall be provided with a timing range as indicated on the Drawings.
4. Time delay relays shall be industrial plug-in blade style.
5. Time delay relays shall indicate the timed out status by either a neon indicating light, LED indicating light, or by mechanical means.
6. Time delay relays shall be provided with a minimum of three Form C contacts, and 10 Amp contact rating.
7. Time delay relay coil voltage shall be either 120 VAC or 24 VDC as indicated on the Drawings.

8. Time delay relays shall be provided with DIN rail mounting bases and hold down clips.

   a. Relay bases shall be of the same manufacturer as the relay.

9. Provide Idec RTE Series, or approved equal.

☑ J. Control Fuses (407800.F01).

1. Control Fuses shall be provided as shown on the Drawings.
2. Control Fuses shall interrupt and isolate electrical power to individual control circuits and components within each enclosure and for circuits and components located outside each enclosure but deriving power from the enclosure.
3. Control Fuses shall be rated at 250 VAC minimum and with current ratings as shown on the Drawings.
4. Control Fuses shall have fast acting and time delay characteristics as dictated by the connected load.
5. Provide five (5) spare fuses of each type and size provided for each control panel.
6. Provide Ferraz-Shawmut type GGM, or approved equal.

☑ K. Selector Switches (407800.S01).

1. Selector switches shall be provided as shown on the drawings.
2. Selector switches shall be of round construction with rotary operators.
3. Selector switches operation shall be to maintain the position turned to unless shown otherwise on the Drawings.
4. Selector switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
5. Selector switch contacts shall be rated at 10 Amps.
6. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

☑ L. Pushbutton Switch (407800.S02).

1. Pushbutton switches shall be provided as shown on the drawings.
2. Pushbutton switches shall be of round construction with push or push-pull operators.
3. Pushbutton switch operation shall be momentary or maintained as shown on the Drawings.
4. Pushbutton switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
5. Pushbutton switch contacts shall be rated at 10 Amps.
6. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

☑ M. Key Switches (407800.S03).

1. Key switches shall be provided as shown on the drawings.
2. Key switches shall be of round construction with rotary operators.
3. Key switches operation shall be to maintain the position turned to unless shown otherwise on the Drawings.
4. Key switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
5. Key switch contacts shall be rated at 10 Amps.
6. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

☑ N. Mushroom Style Pushbutton Switch (407800.S04).

1. Mushroom Style Pushbutton switches shall be provided as shown on the drawings.
2. Mushroom Style Pushbutton switches shall be of round construction with push or push-pull operators.
3. Mushroom Style Pushbutton switch operation shall be momentary or maintained as shown on the Drawings.
4. Mushroom Style Pushbutton switches shall be provided with the number of contacts, switch positions, and other details as shown on the Drawings.
5. Mushroom Style Pushbutton switch contacts shall be rated at 10 Amps.
6. Mushroom Style Pushbutton switches for Emergency Stop and other emergency switches (e.g., Help Me switches) shall be: provided with a red mushroom head; pull to reset; provided with N/C (failsafe) contacts; and shall be non-illuminated.
7. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

☑ O. Indicator Lights (407800.L20).

1. Indicator lights shall be provided as shown on the drawings.
2. Indicator lights shall be of round construction.
3. Indicator lights shall have a built in push-to-test function.
4. Indicator light operation shall be as shown on the Drawings.
5. Indicator light lens colors shall be as shown on the Drawings.
6. Indicator lights shall be provided with high visibility LED lamps with transformers for circuit voltages over 24 VAC/DC, and high visibility LED lamps without transformers for circuits 24 VAC/DC and below.
7. Indicator light contacts shall be rated at 10 Amps.
8. Provide Allen-Bradley Bulletin 800T pilot devices (30mm, NEMA Type 4/4X/13), or approved equal.

P. Speed Setpoint Potentiometer (407800.P20).

1. Speed potentiometers shall be provided as shown on the Drawings.
2. Speed potentiometers shall be of round construction.
3. Speed potentiometers operation shall be as shown on the Drawings.
4. Speed potentiometers shall be 10k-ohm.
5. Provide Allen-Bradley 800H-UR29, or approved equal.

Q. Terminal Strip Identification Block (407800.T15).

1. Provide a terminal strip identification block with a machine generated label to match those shown on the Drawings.
2. Provide a Phoenix Contact marker carrier model number UBE/D, or approved equal.

#73: Terminals provided in FKC scope of supply and pricing will be Phoenix Contact UT4

R. Low Current Terminal Blocks (407800.T10).

1. Low current terminal blocks shall be provided as shown on the Drawings and in all panels requiring low current field terminations. Provide accessories as required and as shown including, but not limited to end anchors, end barriers, bridge jumpers, terminal strip pre-printed markers and snap-in pre-printed terminal block markers.
2. Low current terminal blocks shall be used for electrical circuits rated at or less than 30 amps.
3. Low current terminal blocks shall mount on DIN rail.
4. Low current terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.
5. Low current terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.
6. Low current terminal blocks shall be grey in color.
7. Low current terminal blocks shall be UL rated for up to 30 amps at 600 VAC.
8. Low current terminal blocks shall accept wires from 24 to 10 AWG for single conductor per termination.
9. Provide Phoenix Contact model UK5N, or approved equal.

#74: Ground Terminals provided in FKC scope of supply and pricing will be Phoenix Contact UT4

S. Grounding Terminal Blocks (407800.T60).

1. Grounding terminal blocks shall be provided as shown on the Drawings and in all panels requiring field terminations.
2. Grounding terminal blocks shall be used for electrical circuits rated at or less than 30 amps.
3. Grounding terminal blocks shall mount on DIN rail.
4. Grounding terminal blocks shall be UL rated for a maximum of 30 amps and 600 VAC and to accept wires from 26 to 10 AWG for single conductor per termination.

#74: Ground Terminals provided in FKC scope of supply and pricing will be Phoenix Contact UT4

5. Grounding terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.
6. Low current terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.
7. Grounding terminal blocks shall be green / yellow in color.
8. Provide Phoenix Contact model USLKG5, or approved equal.

#75: Fusible terminal blocks provided in FKC scope of supply and pricing will be Allen Bradley 1492–WFB series.

T. Fusible DC Terminal Blocks (407800.T30).

1. Fusible DC terminal blocks shall be provided for 24 VDC control circuits as shown on the Drawings.
2. Fusible DC terminal blocks shall be rated for use in electrical control circuits rated 6.3 amps or less and 15-30 VAC/DC.
3. Fusible DC terminal blocks shall mount on DIN rail.
4. Fusible DC terminal blocks shall accept 5 mm by 20, 25 or 30 mm fuses and use LED type blown fuse indicators.
5. Fusible DC terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.
6. Fusible DC terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.
7. Fusible DC terminal blocks shall be black in color.
8. Provide Phoenix Contact model UK5 HESILED 24, or approved equal.

U. Fusible AC Terminal Blocks (407800.T35).

1. Fusible AC terminal blocks shall be provided for 120 VAC control circuits as shown on the Drawings.
2. Fusible AC terminal blocks shall be rated for use in electrical control circuits rated 6.3 amps or less and 110-250 VAC/DC.
3. Fusible AC terminal blocks shall mount on DIN rail.
4. Fusible terminal blocks shall accept 5 mm by 20, 25 or 30 mm fuses and use neon blown fuse indicators.
5. Fusible AC terminal blocks shall be supplied with all required accessories including end covers, fixed bridge bars, partition plates and end brackets.
6. Fusible AC terminal blocks shall be supplied with machine printed terminal block and terminal strip identification numbers that match the approved submittals.
7. Fusible AC terminal blocks shall be black in color.
8. Provide Phoenix Contact model UK5 HESILA 250, or approved equal.

V. Wire Identification Labels (407800.L02).

1. Wire identification labels shall be provided for all conductors within control panels and control centers.

2. Wire identification labels shall be machine printed, non-adhesive, wire marker heat shrink sleeves with identification numbers that match the approved submittals.

3. Wire identification labels shall be properly sized for the conductor or cable and shall be white with black characters.

4. Provide Brady, Panduit, or approved equal.

#76: Power supply in FKC scope and pricing may be Trio series based on availability.

W. Power Supply (407800.P02).

1. Power Supplies shall be provided as shown on the Drawings.
2. Power supplies shall operate on 85 to 264V AC / 45 to 65 Hz.
3. Power supplies shall withstand 300V AC short term voltage input.
4. Power supplies shall be rated for 500,000 hours MTBF, minimum.
5. Power supplies shall be rated for less than 15A inrush surge current.
6. Power supplies shall include an internal slow-blow fuse.
7. Power supplies shall include integrated varistors-based transient surge protection.
8. Power supplies shall be adjustable from 22.5 to 29.5V DC output.
9. Power supplies shall be rated for 5A DC output between -25 and 55 degrees Celsius.
10. Power supplies shall be capable of being connected in parallel for increased capacity.
11. Power supplies shall be current limited to 10A short circuit.
12. Power supplies shall be rated for less than 40mV phase to phase residual ripple.
13. Power supplies shall be rated for 3W power loss when idling.
14. Power supplies shall be rated for 14W power loss under nominal maximum load.
15. Power supplies shall include an LED to indicate DC power active.
16. Power supplies shall include a relay contact to indicate DC power active.
17. Power supplies shall be rated at 90% efficient, minimum.
18. Power supplies shall be designed for DIN rail mounting.
19. Power supplies shall be UL508 listed.
20. Provide Phoenix Contact model 2866750 QUINT-PS1/AC24/DC5, or approved equal.

#77: Surge Suppressor in FKC scope of supply and pricing will be Phoenix Contact 2907918

X. Transient Voltage Surge Suppressors (407800.V10).

1. Transient voltage surge suppressors shall be provided as shown on the Drawings.
2. Transient voltage surge suppressors shall be capable of continuously sustaining a minimum of 20 amp for connected loads, operating from 120 VAC power with a line frequency between 47-63 Hz.

3. Transient voltage surge suppressors shall have Classification of 400 VAC for normal/common mode no

See above comment.

4. Transient voltage surge suppressors shall include L-N, L suppression, with noise attenuation of 50dB minimum for normal mode and 40dB minimum for common mode and a peak surge capability of 25kA.

5. Transient voltage surge suppressors shall have a green status LED as well as form C contacts for operating status indication and alarming.

6. Transient voltage surge suppressors shall mount on DIN rail.

7. Provide Sola model STV25K-10S, or approved equal.

☑ Y. Narrow Slot Wire Ducts (Narrow Slot) (407800.W21).

1. Wire ducts shall be provided as shown on the Drawings.

2. Wire ducts shall be large enough to provide a wire fill area no more than 40 percent of the total cross sectional area of the wire ducts.

3. Wire ducts shall be attached to the back panel with screws or plastic fasteners that are approved for use with, and provided by the wire duct manufacturer.

4. Wire ducts shall not be attached to back panel or enclosure side surfaces with glue, tape, or other such adhesives.

5. Wire ducts shall be white in color.

6. Wire ducts shall have slotted sides.

7. Wire ducts shall be provided with removable covers.

8. Provide Panduit Type F, Thomas & Betts Type NPW, or approved equal.

☑ Z. Noise Shield (407800.N20).

1. Noise shields shall be provided as shown on the Drawings.

2. Noise shields shall be designed to provide up to 20 dB reduction in noise, equivalent to six-inch air spacing.

3. Noise shields shall be provided with bonding clips to allow mounting inside wire ducts.

4. Noise shield height shall match the wire duct height.

5. Noise shields shall be perforated and pre-scored.

6. Noise shields shall include vertical wall slots and horizontal cable tie slots.

7. Noise shields shall be zinc plated on all horizontal (contact) surfaces and black powder coated on all vertical surfaces.

8. Noise shields shall be attached to the backpanel with screws or plastic fasteners that are approved for the use and provided by the wire duct manufacturer.

9. Provide Panduit model SD(_)EMI, or approved equal.

☑ AA. Spiral Wrap (407800.W30).

1. Spiral wrap shall be provided as shown on the Drawings and for all conductor and cable wire assemblies that cross hinged connections.
2. Spiral wrap shall be sized per the manufacturer's instructions.
3. Spiral wrapped assemblies shall include a strain relieving loop at each hinge crossing, with a minimum 6 inch vertical height, to minimize flexing of the wires in the conductor and cable assemblies.
4. Provide Panduit, Thomas & Betts, or approved equal.

☑ BB. Cable Ties (407800.W40).

1. Cable Ties shall be provided as required for organizing and arranging conductors within boxes, control panels, and control centers.
2. Cable ties shall be UV resistant.
3. Cable ties shall be black in color.
4. Cable ties shall be installed using a tool from the cable tie manufacturer and specifically intended for use with the cable ties provided.
5. Provide Panduit, Thomas & Betts, or approved equal.

☑ CC. DIN Mounting Rail (407800.D10).

1. DIN Mounting Rail shall be provided as shown on the Drawings and in all panels requiring DIN mounting rail.
2. DIN mounting rails shall be made of steel, galvanized, and yellow chromated.
3. Provide Phoenix Contact model NS 35/7.5, Allen-Bradley model 199-DR1, or approved equal.

☑ DD. Ground Bars (407800.G06).

1. Ground bars shall be provided as shown on the Drawings.
2. Ground bars shall be low profile, "bus" type with set screw or pressure type connections and all copper construction.
3. Ground bars shall include sufficient termination points to accommodate all equipment grounding conductors as shown on the Drawings.
4. Ground bars shall include spare termination points to accommodate twenty (20) additional conductors sized, #14 through #8 AWG.
5. Provide Cutler-Hammer model GBK21, GE model TGK42, Square D model PK27GTA, or approved equal.

☑ EE. Heavy Duty End Bracket (407800.A61).

1. Provide heavy duty end brackets on DIN rails as indicated on the Drawings.
2. Heavy duty end brackets shall be suitable for 35 mm DIN rails.
3. End brackets shall be screw-on style.
4. Provide Phoenix E/AL-NS 35 series or approved equal.

FF. Category 6 Ethernet Patch Cable (407800.C90).

1. Category 6 Ethernet patch cable shall be provided for all Ethernet/IP networked devices.
2. Category 6 Ethernet patch cable shall be suitable for use as Industrial Ethernet Cable, 100BaseTX.
3. Category 6 Ethernet patch cable shall be rated for use in a temperature range between -10 degrees C and 60 degrees C.
4. Category 6 Ethernet patch cable shall be rated for outdoor use.
5. Category 6 Ethernet patch cable shall be rated for 300 volts maximum.
6. Category 6 Ethernet patch cable conductors shall be 4-pair, solid copper, 24 AWG.
7. Category Ethernet patch cable conductor pairs shall be bonded.
8. Category 6 Ethernet patch cable insulation material shall be Polyolefin.
9. Category 6 Ethernet patch cable insulation color shall be blue.
10. Category 6 Ethernet patch cable shall be provided with aluminum foil polyester tape shield with 100% insulation coverage.
11. Category 6 Ethernet patch cable outer jacket material shall be PVC. Jacket material shall be sunlight and oil resistant. Jacket shall have sequential markings at two foot intervals.
12. Category 6 Ethernet patch cable shall be provided with RJ45 plugs, suitable for IP20 applications.
13. Category Ethernet patch cable shall be Belden Data Tuff Industrial Ethernet Cord Set E505 Series, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLERS

A. All identification labeling shall be in compliance with Section 46 76 27 and all other project specifications.

B. CONTRACTOR shall install and connect junction boxes and control panels and to field devices as shown on the Drawings.

C. For all conductors terminating on terminal strips, install crimp-on, insulated plastic sleeve ferrules on each wire. Install ferrules with a crimping tool provided by the ferrule manufacturer for that purpose.

D. Individual conductors and cables shall be grouped together and routed through plastic wire ducts mounted on the backpanel surface.

E. Bond each enclosure back-panel to the grounding electrode system with a # 8 AWG copper conductor.

F. Where conductors and cables are routed in boxes or enclosures, they shall be neatly bundled with cable ties at intervals not to exceed 12 inches on center. The tension for the cable ties shall be set with a tool specifically made for this purpose and of the same

manufacturer as the cable tie. Side cutters or other type tools shall not be used to cut the tail end of the cable tie. The CONTRACTOR shall only use the tool specifically made for this purpose and designed for use with the cable ties provided.

3.02 SOURCE QUALITY CONTROL

A. Tests and Inspections

1. All equipment shall be tested prior to site delivery. All equipment shall be field tested prior to commissioning. CONTRACTOR shall notify the ENGINEER 14 days prior to commencement of field testing.

2. CONTRACTOR-developed test forms shall accompany the notification of testing.

   a. Test forms shall list all field connections at terminal strips and all internal logic circuits, along with the method planned for simulation of field conditions to test these connections and circuits.

3. All analog instrument loops shall be tested using an analog signal generator by applying the appropriate control signal to the field termination terminal strip.

   a. At a minimum, analog instrument tests shall be made at 0%, 25%, 50%, 75%, and 100% of maximum control signal.

   b. Additional analog instrument tests shall be made as appropriate.

4. All digital control circuits shall be tested by: applying the appropriate control voltage to the field termination terminal strip when externally supplied; using a jumper at the field termination terminal strip when internally supplied; or, if applicable, at an internal panel connection point when field terminations are not used.

B. Verification of Performance

1. Device functions shall be observed by the ENGINEER, to determine satisfactory operation of the device and connected circuit continuity, prior to shipment.

3.03 FIELD QUALITY CONTROL

A. Site Tests, Inspection

1. CONTRACTOR shall install, calibrate and test, all systems prior to notifying ENGINEER of witness testing verification.

2. The ENGINEER shall systematically verify the process control system is operating as designed. The CONTRACTOR shall perform the tasks necessary to confirm proper operation to the ENGINEER.

END OF SECTION

Attachment A – Passivation Techniques

FKC Uses 4 methods for passivation of stainless steel members. The best method is selected based on component type and environmental conditions.

1. **Acid Bath:** A tank of nitric acid is used to immerse the component for a set period of time. After immersion, the component is rinsed with high pressure cold water.

2. **Pickle Paste**: A pickling paste, a mixture of hydrofluoric and nitric acids, is used on larger structural stainless steel members to passivate welds. Pickle paste is applied to the affected surface. The paste dissolves the oxide layer exposing the chromium rich stainless steel. The paste is removed with high pressure cold water. The chromium then naturally produces a thin layer of chromium oxide that protects the stainless steel from corrosion.

3. **Electro-Chemical Passivation**: Electo-chemical passivation is used on sheet metal parts to passivate welds. An electrical current is used with a nitric acid solution to remove oxide layer and expose the chromium rich stainless steel. The solution is removed with water. The chromium then naturally produces a thin layer of chromium oxide that protects the stainless steel from corrosion.

4. **Abrasives Weld Cleaning**. Abrasive weld cleaning is used on small welds or weld with a heavy oxide layer. Stainless steel wire brushed, abrasive pad or disk may be used as required. The mechanical removal of surface oxides exposes the chromium rich stainless steel. The chromium then naturally produces a thin layer of chromium oxide that protects the stainless steel from corrosion.

EXTENDED WARRANTY FORM
(For Equipment, Material, Process)

Extended Warranty For:	Screw Press Dewatering Equipment
Specification Section No:	46 76 27
Product Manufacturer:	FKC Co., Ltd.
Project:	Mahler WRF Improvements
Location:	City of Sweet Home, Oregon

We hereby guarantee the Screw Press Dewatering Equipment that we have constructed for a period of 24 months from delivery or 18 months after startup, whichever comes first ~~year(s), as specified in the Section noted above,~~ from Date TBD, the date of ~~acceptance of the work/substantial completion and the assumption of occupancy and beneficial use by~~ delivery or startup to the City of Sweet Home, Oregon.

The following are excluded from the provisions of this warranty:

Coating Systems – coating systems will have warranty of 24 months from delivery or 18 months after startup, whichever comes first.

FKC warrants the equipment supplied per Section 46 76 27 including screw press, flocculation tank, polymer blending unit, control panel, instrumentation, skid and instrumentation for a period of 24 months from delivery or 18 months after startup, whichever comes first

FKC offers a 10-year Extended Mechanical Warranty which includes all the mechanical components of the dewatering screw press. The Extended Mechanical Warranty shall be for 10 years after start-up. The following mechanical items on the screw press will be covered by this warranty:

1. All screw shaft bearings and seals.
2. Screens and drums on the screw press.
3. The screw shaft, shell, and flights, i.e. the entire screw.
4. The Sumitomo Cyclo drive reducer.
5. Screw press base, inlet stand, and discharge box.

This Extended Mechanical Warranty requires that the WWTP staff document that the equipment is lubricated according to the Manufacturer's recommendations as follows.

a. The screw shaft bearings will be lubricated per the FKC supplied O&M manual.
b. The Sumitomo Cyclo drive reducer will have the recommended oil and the oil will be changed as specified in the Sumitomo maintenance manual.

This Extended Mechanical Warranty does not cover the following items:

a. Flocculation tank, polymer blending unit, valves, piping, pipe fittings, conduit, conduit fittings and skid.
b. Control Panel, motors, field instrumentation, power control, logic control, or any other electronic components.
c. Routine maintenance such as lubrication, washing & cleaning, and periodic dismantling (once or twice in the ten-year period) for screw inspection and screw flight to screen clearance adjustment.
d. Painting and coating systems.
e. Corrosion caused by the sludge being processed or the local environmental conditions.
f. Damage due to:

    1) Large foreign objects (wood, metal, rocks, etc.) getting into the screw press.
    2) Processing any material not conforming to the original design specification the unit was purchased under, this includes but is not limited to 100% primary sludge, 100% septic tank sludge, sludge with a high grit content that exceeds 50% non-volatile solids content, etc.

We agree that if any of the equipment, material, or process designated for Screw Press Dewatering Equipment should fail due to any reason other than improper maintenance or improper operation, or should any portion of the work fail to fulfill any of the requirements of the Specifications, we will, within ten days after written notice of such defects, commence to repair or replace the same together with any other work which may be damaged or displaced in so doing.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time after being notified, or should exigent circumstances require repairs or replacements to be made before we can be notified or respond to notification, we do hereby authorize the Name of Owner to proceed to have the defect repaired and made good at our expense, and we will pay the cost therefor upon demand.

The warranty provided herein shall not be in lieu of but shall be in addition to any warranties or other obligations otherwise imposed by the Contract Documents and by law.

Manufacturer: FKC Co., Ltd.	Contractor:
Signed: __ To be signed with written agreement	Signed:
Title: Vice President	Title:
Date: TBD	Date:
Phone: (360) 452-9472 x104	Phone:
E-mail: tbohman@fkcscrewpress.com	E-mail:

EXAMPLE ONLY

EXTENDED WARRANTY FORM
(For Equipment, Material, Process)

Extended Warranty For:	Shaftless Screw Conveyors
Specification Section No:	41 12 13
Product Manufacturer:	FKC Co., Ltd.
Project:	Mahler WRF Improvements
Location:	City of Sweet Home, Oregon

We hereby guarantee the Shaftless Screw Conveyors that we have constructed for a period of three year(s), as specified in the Section noted above, from Date TBD, the date of ~~acceptance of the work/substantial completion and the assumption of occupancy and beneficial use by~~ delivery to the City of Sweet Home, Oregon.

The following are excluded from the provisions of this warranty:

Coating Systems – coating systems will have warranty of 24 months from delivery or 18 months after startup, whichever comes first.

We agree that if any liner or spiral of the ~~equipment, material, or process designated for~~ Shaftless Screw Conveyors should have excessive wear as defined in paragraphs 1.07.2.a & 1.07.3.a of Section 46 76 27, ~~fail due to any reason other than improper maintenance or improper operation, or should any portion of the work fail to fulfill any of the requirements of the Specifications~~, we will, within ten days after written notice of such defects, commence to repair or replace the same together with any other work which may be damaged or displaced in so doing.

We also agree that if any of the equipment, material, or process designated for Shaftless Screw Conveyors should fail due to any reason other than improper maintenance or improper operation, or should any portion of the work fail to fulfill any of the requirements of the Specifications, we will, within ten days after written notice of such defects, commence to repair or replace the same together with any other work which may be damaged or displaced in so doing.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time after being notified, or should exigent circumstances require repairs or replacements to be made before we can be notified or respond to notification, we do hereby authorize the City of Sweet Home, Oregon to proceed to have the defect repaired and made good at our expense, and we will pay the cost therefor upon demand.

The warranty provided herein shall not be in lieu of but shall be in addition to any warranties or other obligations otherwise imposed by the Contract Documents and by law.

Manufacturer: FKC Co., Ltd.

Signed: _To be signed with written agreement_____

Title: Vice President

Date: TBD

Phone: (360) 452-9472 x104

E-mail: tbohman@fkcscrewpress.com

Contractor: _____

Signed: _____

Title: _____

Date: _____

Phone: _____

E-mail: _____

EXAMPLE ONLY

EXTENDED WARRANTY FORM
(For Equipment, Material, Process)

Extended Warranty For:	Polymer Blending Unit
Specification Section No:	46 33 33
Product Manufacturer:	FKC Co., Ltd.
Project:	Mahler WRF Improvements
Location:	City of Sweet Home, Oregon

We hereby guarantee the Polymer Blending Unit that we have constructed for a period of 24 months from delivery or 18 months after startup, whichever comes first ~~year(s), as specified in the Section noted above,~~ from Date TBD, the date of ~~acceptance of the work/substantial completion and the assumption of occupancy and beneficial use by~~ delivery or startup to the City of Sweet Home, Oregon.

The following are excluded from the provisions of this warranty:

None.

We agree that if any liner or spiral of the ~~equipment, material, or process designated for~~ Shaftless Screw Conveyors should have excessive wear as defined in paragraphs 1.07.2.a & 1.07.3.a of Section 46 76 27, ~~fail due to any reason other than improper maintenance or improper operation, or should any portion of the work fail to fulfill any of the requirements of the Specifications~~, we will, within ten days after written notice of such defects, commence to repair or replace the same together with any other work which may be damaged or displaced in so doing.

We also agree that if any of the equipment, material, or process designated for Shaftless Screw Conveyors should fail due to any reason other than improper maintenance or improper operation, or should any portion of the work fail to fulfill any of the requirements of the Specifications, we will, within ten days after written notice of such defects, commence to repair or replace the same together with any other work which may be damaged or displaced in so doing.

In the event of our failure to comply with the above-mentioned conditions within a reasonable time after being notified, or should exigent circumstances require repairs or replacements to be made before we can be notified or respond to notification, we do hereby authorize the City of Sweet Home, Oregon to proceed to have the defect repaired and made good at our expense, and we will pay the cost therefor upon demand.

The warranty provided herein shall not be in lieu of but shall be in addition to any warranties or other obligations otherwise imposed by the Contract Documents and by law.

Manufacturer: FKC Co., Ltd.	Contractor: _____
Signed: To be signed with written agreement	Signed: _____
Title: Vice President	Title: _____
Date: TBD	Date: _____
Phone: (360) 452-9472 x104	Phone:
E-mail: tbohman@fkcscrewpress.com	E-mail:

EXAMPLE ONLY

SCADA

PLC

FKC assumes this is PLC on dewatering skid

= included in FKC scope of supply

X = not included in FKC scope of supply

FLOW FY 250-21

FLOW RATE FT 250-00 | FLOW PACE FQ 250-00 | READY YI 250-01A | RUN'G YL 250-01B | IN REMOTE HS 250-01 | FAULT XA 250-01 | START CMD YC 250-01 | SPEED FDBK SI 250-01 | SPEED CTRL SC 250-01 | HI LEVEL LSH 250-01

READY YI 250-02A | RUN'G YL 250-02B | IN REMOTE HS 250-02 | FAULT XA 250-02 | START CMD YC 250-02 | SPEED FDBK SI 250-02 | SPEED CTRL SC 250-02 | LEVEL LI 250-02

E/IP

Note: OK via CAT6 Ethernet

Display on HMI

Screen

VFD-250-01 — FAULT YA 250-01 A | CTRL POWER YL 250-01B W | RUN'G YL 250-01A R | RESET HS 250-01A

VFD-250-01 — FAULT YA 250-02 A | CTRL POWER YL 250-02B W | RUN'G YL 250-02A R | RESET HS 250-02A

Available directly on VFD inside panel

LCS-250-01

LOR HS 250-01 | FAST STOP PB 250-01A | FAULT YA 250-01A A

SPEED HS 250-01B | START PB 250-01B | STOP PB 250-01C | RUN YA 250-01B R

LOR HS 250-02 | FAST STOP PB 250-02A | FAULT YA 250-02A A

SPEED HS 250-02B | START PB 250-02B | STOP PB 250-02C | RUN YA 250-02B R

POL D I-253 FROM POLYMER MAKEDOWN

DS F-640 FROM SLUDGE BLEND TANK

UW FROM UTILITY WATER LOOP

FIT 250-00 | FE 250-00

LSH 250-01

4"-DS | 4"x6" | 6" | 4"

MIX-250-01 CONDITIONING TANK MIXER

LE 250-02 | LIT 250-02

DEW-250-02 DEWATERING SCREW PRESS

DEWATERING EQUIPMENT VENDOR PACKAGE

VENDOR FURNISHED PACKAGE SYSTEM

FS 250-21 — 24 VDC — 120V

2"-UW | CV-250-11 | CV-250-12 | CV-250-13

FS 250-22 — 24 VDC — 120V

FS 250-23 — 24 VDC — 120V

1 1/2"-UW

CHUTE

A I-252 DEWATERING CAKE CONVEYOR

6"-DR

CLEAN OUT

DR B I-252 TO RDPS

NO.	DATE	BY	REVISION

NOTICE — 0 ½ 1 — IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

MB DESIGNED | AT DRAWN | WJS CHECKED

PRELIMINARY ONLY DO NOT USE FOR CONSTRUCTION

SEPT 2022

West Yost www.westyost.com

WEST YOST Water. Engineered.

Sweet Home Oregon

MAHLER WATER RECLAMATION FACILITY IMPROVEMENT PROJECT

SOLIDS DEWATERING 1

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: SEPTEMBER 2022

SHEET I-251 - of ###

I-251.dwg I-251 12/15/2022 8:56 AM AARON

SCADA

PLC

FKC assumes this is PLC on dewatering skid

ZERO SPEED SIL 250-03 | PULL CORD HS 250-03 | RUN'G YL 250-03 | IN REMOTE HS 250-03 | FAULT XA 250-03 | START CMD YC 250-03

ZERO SPEED SIL 250-04 | PULL CORD HS 250-04 | RUN'G YL 250-04 | IN REMOTE HS 250-04 | FAULT XA 250-04 | START CMD YC 250-04

ZERO SPEED SIL 250-05 | PULL CORD HS 250-05 | RUN'G YL 250-05 | IN REMOTE HS 250-05 | FAULT XA 250-05 | START CMD YC 250-05

No

Displayed on HMI

Stream

DEWATERING EQUIPMENT VENDOR PACKAGE

MS-250-03: FAULT YA 250-03 A | RUN'G YL 250-03A R | CTRL POWER YL 250-03B W

MS-250-04: FAULT YA 250-04 A | RUN'G YL 250-04A R | CTRL POWER YL 250-04B W

MS-250-05: FAULT YA 250-05 A | RUN'G YL 250-05A R | CTRL POWER YL 250-05B W

LCS-250-01: LOR HS 250-03 | FAST STOP PB 250-03A | RUN'G YL 250-03A R | START PB 250-03B | STOP PB 250-03C | FAULT YA 250-03B A

LCS-250-04: LOR HS 250-04 | FAST STOP PB 250-04A | RUN'G YL 250-04A R | START HS 250-04B | STOP PB 250-04C | FAULT YA 250-04B A

LCS-250-02: LOR HS 250-05 | FAST STOP PB 250-05A | RUN'G YL 250-05A R | START HS 250-05B | STOP PB 250-05C | FAULT YA 250-05B A

= included in FKC scope of supply

X = not included in FKC scope of supply

Note (1)

A I-251 DEWATERING SCREW PRESS

CHUTE

SSL 250-03 | HS 250-03 ES

CON-250-03 DEWATERING CAKE CONVEYOR

CV 250-41

X"-DR

SSL 250-04 | HS 250-04 ES

CON-250-04 HORIZONTAL CONVEYOR

DUMPSTER 2

H-250-06 LIDDING SYSTEM HOIST

SSL 250-05 | HS 250-05 ES

CON-250-05 LIDDING SYSTEM CONVEYOR

DUMPSTER 1

10"-DR

DR B I-251 FROM SOLIDS DEWATERIN 1

DR I-130 TO DRAIN

Note (1)
Contractor to make connections to junction box on skid.

NO.	DATE	BY	REVISION

NOTICE: IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE (0 ½ 1)

MB DESIGNED | AT DRAWN | WJS CHECKED

PRELIMINARY ONLY — DO NOT USE FOR CONSTRUCTION

SEPT 2022

West Yost
www.westyost.com

WEST YOST
Water. Engineered.

Sweet Home Oregon at its best

MAHLER WATER RECLAMATION FACILITY IMPROVEMENT PROJECT

SOLIDS DEWATERING 2

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: SEPTEMBER 2022

SHEET I-252 - of ###

I-252.dwg I-252 12/15/2022 9:16 AM AARON

SCADA

PLC

FKC assumes this is PLC on dewatering skid

FLOW FAULT XA 250-04 | RUN'G YI 250-04 | REMOTE HS 250-04 | SPEED CTRL SC 250-04 | REMOTE START YC 250-04

SHOWER IN-USE ALARM FS 250-00

HTR-250-09
TANKLESS WATER HEATER

AV

FSH 250-09

EYS-250-09
EYE WASH/SHOWER

PW
D I-530
FROM POTABLE WATER CONNECTION

1"-PW

PI 250-6A

1"-PW

LCS-250-06
LOR HS 250-04 | START PB 250-04 | STOP PB 250-04 | SPEED HS 250-04 | POWER ON YA 250-04 | RUN YA 250-04 | FAULT YA 250-04 | FAST STOP PB 250-04

DEWATERIN EQUIPMENT VENDOR PACKAGE

SV 250-06 UW

FSL 250-06A

FI 250-06A

FI 250-06B

PI 250-06B

PI 250-06

FSL 250-06B

MIX-250-07
MIXER

POL

TNK-250-06
MIXING CHAMBER

POLYMER STORAGE
TOTE

FEED PUMP

POL-250-06
POLYMER MAKEDOWN SYSTEM

POL
D I-251
TO SOLIDS DEWATERING

= included in FKC Scope of supply

X = not included in FKC Scope of supply

#13: See FKC comments in Section 46 33 33.

I-253.dwg I-253 12/6/2022 3:00 PM AARON

NO.	DATE	BY	REVISION

NOTICE
0 ½ 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

MB DESIGNED
AT DRAWN
WJS CHECKED

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION
SEPT 2022
West Yost
WWW.WESTYOST.COM

WEST YOST
Water. Engineered.

Sweet Home Oregon

MAHLER WATER RECLAMATION FACILITY IMPROVEMENT PROJECT

POLYMER MAKEDOWN

PROJECT NO.: 936-50-21-09 | SCALE: AS SHOWN | DATE: SEPTEMBER 2022

SHEET
I-253
- of ###

FKC CO., LTD.

2708 West 18th Street
Port Angeles, WA 98363

(360) 452-9472
FAX (360) 452-6880

January 21, 2023

Greg Springman
Public Works Director
City of Sweet Home, Oregon
3225 Main Street
Sweet Home, OR 97386

Ph: (541) 367-5128
Email: gspringman@sweethomeor.gov

Cc: Bill Schilling bschilling@westyost.com; Steven Haney <shaney@sweethomeor.gov>;
Trish (Patricia) Rice <price@sweethomeor.gov>;
Preston Van Meter <pvanmeter@westyost.com>; Gary Jenks gjenks@tag-inc.us

Mr. Springman,

In response to a request for additional input and information, FKC Co., Ltd. offers the following for addition and cost adder to the of the FKC Bid dated 5 January 2023 offered to the City of Sweet Home, Oregon:

1. Control Panel
    a. The standard FKC control panel has a fault light and running light for each of the motor starters (MS) and variable frequency drives (VFD) housed within the FKC enclosure.
    b. FKC agrees to provide LOR switches instead of HOA switches for each MS and VFD.
    c. FKC also agrees to add a start button and stop button for each MS and VFD that would start and stop a given motor when its LOR switch is in local.
    d. In leu of a control power light for each MS and VFD, FKC agrees to add a single control power light for the entire enclosure.
    e. The standard FKC control panel has reset buttons for each VFD on the device pop-ups on the HMI screen. This will be provided instead of any reset buttons on the panel front.
    f. FKC offers one E-stop on the panel front which stops all the equipment powered by the FKC control panel. FKC has no dynamic breaking, etc. for any of the equipment for which we provide power control. A Fast Stop is therefore not possible.
        i. The Owner can daisy chain as many field installed E-stops next to the equipment as needed to provide additional E-stop buttons. But for the FKC control panel and scope of supply, only the single Estop on the panel front is included.

g. Some of the spare IO can used by the customer to temporarily control some components not provided by FKC. FKC will provide a spare routine within the program and spare space in the HMI for customer use. This does not include FKC needing to add anymore hardware, memory, programming, or labor to accommodate this request. FKC will not be responsible for any programming, testing or issues that come from customer use.

2. Polymer System
    a. Due to time constraints, the proposed Velodyne polymer system to be used is a unit that FKC currently has in stock from another project. The polymer system control panel is to be provided as is and has a UL sticker provided. FKC cannot alter the circuitry in the control panel without affecting the UL approval. Therefore, FKC cannot offer the start button, stop button, or fast stop to be added to the polymer system control panel.
    b. The Owner may alter the control panel after FKC has delivered the unit to add these three buttons. Please coordinate with FKC for the control panel and programming if the Owner chooses to do this.

3. Conveyors
    a. The 1st inclined conveyor has been adjusted to match the drawings provided by email.
        i. FKC will provide the supports legs for the 1st inclined conveyor.
        ii. If the last set of support legs can be within 6 linear feet of the gearbox/motor, then no hanger supports will be required for the gearbox/motor end of the conveyor.
    b. The 2nd conveyor has been changed from a horizontal to an 11-degree inclined conveyor. The 2nd conveyor length has also been adjusted to match the drawings provided by email.
        i. FKC scope and price does not include any supports for the 2nd conveyor such as support legs, hangers, or support structures above the conveyor.

4. Field Services
    a. FKC confirms that 2 trips for a total of 8 on-site days are included in the original FKC bid dated 5 January 2023.

The total cost adder for these adjustments to the FKC bid and scope of supply is $18,442.
This amount includes additional bonding money to cover the adjusted total price should this amount be added in the total price of the FKC bid.

Thank you,

Trent Bohman / FKC Co., Ltd.

REQUEST FOR COUNCIL ACTION

Title:	Resolution for Signage for Recreational Vehicle (RV)
Preferred Agenda:	February 14, 2023
Submitted By:	Robert Snyder, City Attorney
Reviewed By:	Kelcey Young, City Manager
Type of Action:	Resolution___ Motion___ Roll Call___ Other_x__
Relevant Code/Policy:	SHMC Chapter 10.04.030 Powers of City Council(Signage)
Towards Council Goal:	Goal 2 (1) Update and streamline processes and Goal 3(2) Improve community safety. Vision Statement I & II WE ASPIRE to have a desirable community and an effective and efficient local government.
Attachments:	None

PURPOSE FOR THIS RCA:

Presentation of a proposed Resolution concerning signage for recreational vehicles in violation of SHMC 10.28.020(A) that restricts RV parking on public streets and public alleys.

BACKGROUND/CONTEXT:

The City recently passed in ordinance form SHMC 10.28.020(A) that restricts the parking of an RV on certain public streets and public alleys. The proposed Resolution uses the authority given under SHMC 10.04.030 to place signs in the city notifing the public of the restrictions by telling them where information can be obtained about the parking of an RV on the public street or public alley.

THE CHALLENGE/PROBLEM:

Should the City of Sweet Home pass the proposed Resolution ?

STAKEHOLDERS

Staff- for signage that will be helpful in dealing with the enforcement of the code in regard to informing the public of SHMC 10.28.020(A).

City Council - for effective enforcement of SHMC 10.28.020(A).
Citizens of Sweet Home - for effective and efficient local government in dealing with parking of RVs within the city.

ISSUES & FINANCIAL IMPACTS:
The financial terms of the proposed ordinance are sign purchases .

ELEMENTS OF A STABLE SOLUTION:
Giving information to the public about a code provision that could impact them.

OPTIONS:

1. Do Nothing- do not put up signage.
2. Motion to pass the Resolution as presented.
3. Direct Staff to research other ways to accomplish the same goals.

RECOMMENDATION:

Option 2 is the recommended option: Motion to pass the resolution as presented.

RESOLUTION NO. 2 FOR 2023

A RESOLUTION FOR RV SIGNAGE

WHEREAS, SHMC 10.04.030 provides that City Council may by resolution establish traffic controls and parking controls which shall become effective upon the installation of appropriate signs;

WHEREAS, SHMC 10.28.020(A) pertaining to the parking of recreational vehicles on public streets and public alleys would be promoted by signage to notice the public of the parking restrictions contained in said subsection;

WHEREAS, This authority for the placement of signage is in addition to any other authority given by charter, ordinance or statute to the city;

NOW THEREFORE, BE IT RESOLVED BY THE SWEET HOME CITY COUNCIL that pursuant to the above said SHMC provisions signage is to be placed within the City of Sweet Home that notices the public of the restrictions of SHMC 10.28.020(A). The signage shall be substantially in the form that is attached hereto and made a part hereof.

This resolution shall become effective upon being passed by the City Council and approved by the Mayor and the signage installed.

PASSED by the City Council and approved by the Mayor this ____day of _____, 2023.

_____
Mayor

ATTEST:

_____
City Manager - Ex Officio City Recorder

Exhibit for Resolution No. 2 for 2023

NO RV PARKING
RECREATIONAL VEHICLE
(INCLUDING TRAVEL TRAILERS)
PARKING
IS RESTRICTED IN
CITY OF SWEET HOME
MORE INFORMATION
AT POLICE STATION
AND CITY HALL
BY AUTHORITY OF
SHMC 10.28.020(A)

REQUEST FOR COUNCIL ACTION

Title:	Ordinance for Recreational Vehicle (RV) Towing
Preferred Agenda:	February 14, 2023
Submitted By:	Robert Snyder, City Attorney
Reviewed By:	Kelcey Young, City Manager
Type of Action:	Resolution___ Motion___ Roll Call___ Other_x__
Relevant Code/Policy:	SHMC Chapter 10.08 Stopping, Standing And Parking
Towards Council Goal:	Goal 2 (1) Update and streamline processes and Goal 3(2) Improve community safety. Vision Statement I & II WE ASPIRE to have a desirable community and an effective and efficient local government.
Attachments:	SHMC 10.28.020(A) SHMC 10.08.030(G)

PURPOSE FOR THIS RCA:

Presentation of a proposed additional section to SHMC Chapter 10.08 in Ordinance form concerning the custody, towing and disposition of recreational vehicles in violation of SHMC 10.28.020(A) that restricts RV parking on public streets and public alleys.

BACKGROUND/CONTEXT:

The City recently passed in ordinance form SHMC 10.28.020(A) that restricts the parking of an RV on certain public streets and public alleys. As part of the enforcement of this part of the SHMC the proposed ordinance sets forth procedures to follow for the custody, removal and disposition of the RV if left in violation of the code. The proposed ordinance uses portions of ORS 819 (that deal in part with the towing of abandoned vehicles and hazard vehicles on a roadway) and current SHMC Chapter 10.08 (that deals in part with parking on city streets) provisions to direct how the City will proceed when a towing is necessary. In short the proposed ordinance treats the RV as if it were an "abandoned vehicle" which calls for a notification before towing by "posting" on the RV a notice telling a parking offender what is going to happen if the RV is not moved and his/her rights to appeal etc. It further sets forth the procedure to follow when the RV is towed directly after the posting/appeal period or a month later by treating the RV that is in violation of SHMC 10.28.020(A) as if the RV were a "traffic hazard" vehicle

which means it can be towed but then notice is given to the appropriate parties listed in the ORS after the tow with a right to appeal and the rights and duties of the parties to the tow ect. SHMC 10.08.030(G) already sets forth the useage of the above sections of ORS 819 for other violations of parking within the City. The 48 hours to post is the same time frame that the City uses for a vehicle parked on a city street. ORS 819.190(6) referred to in the proposed ordinance only allows for one hearing whereas the proposed ordinance allows two since they may be some time apart in certain cases.
The Notwithstanding subsection limits the time that the City can use the "abandoned vehicle" process to then proceed to the "traffic hazard" to one year and to parking offenders who have had an opportunity to contest the "abandoned vehicle" process. These terms will enhance the ordinance with a review court and should not impact the enforcement of the ordinance.
The proposed ordinance also addresses the issuance of a municipal court violation citation. The idea of eliminateing it during the 48 hours and appeal time is so that there is no misunderstanding about time lines and what a parking offender has to do. Finally the 24 hour warning before a citation is given is so that the parking offender has an opportunity to come into compliance with the code.

THE CHALLENGE/PROBLEM:
Should the City of Sweet Home pass the proposed ordinance ?

STAKEHOLDERS
Staff- for an ordinance provision that will be helpful in dealing with the enforcement of the code in regard to custody, towing and disposal of a RV that is in violation of SHMC 10.28.020(A).
City Council - for an effective remedy for RV parking in violation of city code.
Citizens of Sweet Home - for effective and efficient local government in dealing with parking of RVs within the city.

ISSUES & FINANCIAL IMPACTS:
The financial terms of the proposed ordinance are towing fees .

ELEMENTS OF A STABLE SOLUTION:
Using the state law and city code provisions that are already being used by the city to set forth the procedures in taking custody of an RV and towing and disposing of it.

OPTIONS:
1. Do Nothing- Keep the current ordinance without the new provisions.
2. Motion to conduct a first reading of the proposed ordinance as presented- If the voting is unanimous, a second reading, by title only, may take place during the same meeting.
3. Motion to conduct a first reading of the proposed ordinance with changes- The Council may make changes to the proposed ordinance. If the voting is unanimous, a second reading, by title only, may take place during the same meeting.
4. Direct Staff to research other ways to accomplish the same goals.

RECOMMENDATION:
Option 2 is the recommended option: Motion to conduct a first reading of the proposed ordinance as presented.

10.08.030 PROHIBITED PARKING

In addition to provisions of the motor vehicle laws of Oregon prohibiting parking, no person shall park:

A. A vehicle upon any bridge, viaduct or other elevated structure used as a street or within a street tunnel in the city, unless marked or indicated otherwise;

B. A vehicle in any alley, except to load or unload persons or materials not to exceed 20 consecutive minutes in any two-hour period;

C. A vehicle upon any street for the principal purpose of:

1. Displaying the vehicle for sale;

2. Washing, greasing or repairing the vehicle, except repairs necessitated by an emergency;

3. Selling merchandise from the vehicle, except in a duly established market place or when so authorized or licensed under the ordinances of this city; and/or

4. Storage or as junkage or dead storage for more than 24 hours.

D. A vehicle upon any parkway, except where specifically authorized;

E. A vehicle upon any street, except an alley, for more than 48 hours;

F. A vehicle in violation of authorized signage or barrier; and

G. Vehicles that are parked in violation of subsections C.4. and E. of this section may be towed and disposed of as if the vehicle were an "abandoned vehicle", under O.R.S. 819.110 to O.R.S. 819.215, inclusive. Vehicles that are parked in violation of subsection F. may be towed and disposed of as if the vehicle were a "traffic hazard" under O.R.S. 819.120 to O.R.S. 819.215 inclusive with notice being given within 48 hours. The persons involved shall have all the rights and duties created thereby. This authority to tow and dispose of the vehicle is in addition to any other authority to tow or dispose of vehicles.

(Ord. 1240, § 20, 2015; Ord. 1187, § 5, 2006; Ord. 1036, §§ 2F—2I, 1991; Ord. 985, § 1, 1989; Ord. 380, § 10, 1961)

ORDINANCE BILL NO. 3 FOR 2023

ORDINANCE NO. 1309

SWEET HOME ORDINANCE AMENDING SHMC §10.28.020 LIMITED PARKING; PERMIT PARKING WITH EXPEDIENCY CLAUSE

WHEREAS, Parking of recreational vehicles (including travel trailers) on public streets or alleys typically requires two or three normal-sized parking spaces; and,

WHEREAS, Parking of recreational vehicles (including travel trailers) on public streets or alleys dangerously impairs the view of drivers; and,

WHEREAS, The use of recreational vehicles (including travel trailers) typically generates trash, debris, and sewage; and,

WHEREAS, The above safety and health concerns need to be addressed as soon as possible, an expediency clause has been included in this ordinance.

NOW THEREFORE,

The City of Sweet Home does ordain as follows:

Section 1. SHMC §10.28.020(A) is amended to include the following subsection:

A. No person shall park or place, or allow to be parked or placed, any recreational vehicle on any public street or alley for any period of time, except as follows:

1. Recreational vehicles may be parked for a period of up to two hours anywhere on Main Street or on Long Street between Holley Road and 18th Avenue, so long as they comply with other City and State parking regulations.

2. An uninhabited recreational vehicle may be parked, stored or left on a public street for up to five cumulative days in a 30-day period, but only if the vehicle is parked directly in front of the owner's property. Such vehicle must be parked in a manner not to interfere with emergency, utility and postal vehicles and must be parked in compliance with local and state law.

3. Recreational vehicles owned by a public agency are exempt from this prohibition.

Section 2. The following subsections of SHMC §10.28.020 LIMITED PARKING; PERMIT PARKING shall be lettered in alphabetical order as follows: The current subsection A shall be lettered B, the current subsection B shall be lettered C, and so forth, so as to include all current subsections.

Section 3. EXPEDIENCY CLAUSE. It is hereby adjudged and declared by the Sweet Home City Council that existing conditions are such that this ordinance is needed to be in effect at the time and date of its passage by the City Council and approval by the Mayor and it is hereby declaring an emergency to promote the public health, safety and welfare.

PASSED by the Council and approved by the Mayor this 24th day of January, 2023.

ORDINANCE BILL NO. 6 FOR 2023

ORDINANCE NO._____

SWEET HOME ORDINANCE CREATING SHMC SECTION 10.08.033 PERTAINING TO RECREATIONAL VEHICLE CUSTODY, TOWING AND DISPOSITION WITH EXPEDIENCY CLAUSE

WHEREAS, The City of Sweet Home has recently passed by ordinance SHMC 10.28.020(A) that restricts recreational vehicle parking on certain public streets and public alleys and this ordinance pertaining to the custody, towing and disposal of a recreational vehicle found in violation of said SHMC subsection should be passed as soon as possible to help implement said SHMC subsection and protect the public health, safety and welfare, therefore an expediency clause is included in this ordinance;

Now therefore,

The City of Sweet Home does ordain as follows:

Section 1. SHMC Section 10.08.033 is titled hereby to read as RECREATIONAL VEHICLE TOWING and is created to read as follows:

A. After 48 hours (This is in place of the 24 hour period for notice as set forth for an abandoned vehicle in ORS 819.) a recreational vehicle that is in violation of SHMC 10.28.020(A) may be taken into custody, towed and disposed of as if it were an "abandoned vehicle" under SHMC 10.08.030(G) except if a recreational vehicle has been posted (i.e. attaching notice to the recreational vehicle) as part of an above "abandoned vehicle" process for this subsection and a police report or code enforcement report has been made verifying same and the time for the above process has expired then thereafter (except during an appeal as proscribed therein)if the recreational vehicle is found anywhere within the City of Sweet Home out of compliance with SHMC 10.28.020(A) the recreational vehicle can be taken into custody, towed and disposed of pursuant to SHMC 10.08.030(G) as if it were a "traffic hazard" vehicle. ORS 819.190(6) does not apply to the above subsection.

B. Notwithstanding the above provisions in this section and subsection 10.08.030(G):

1. No recreational vehicle shall be towed as a "traffic hazard" based on a prior "abandoned Vehicle" police report or code enforcement report as stated in this section more than one year after the date of the posted notice on the recreational vehicle.

2. No recreational vehicle shall be towed as a "traffic hazard" based on a prior "abandoned Vehicle" police report or code enforcement report as stated in this section if the parking offender has not had the opportunity to contest the "abandoned vehicle" process herein.

3. All hearings for an “abandoned vehicle” and a “hazard vehicle” shall be supported by reliable, probative and substantial evidence on the whole record.

C. No municipal court violation citation shall be issued for violation of SHMC 10.28.020(A) for the time of the posting and appeal time.

D. Before a municipal court violation citation for violating SHMC 10.28.020(A) is issued a 24 hour notice of the requirements of said subsection shall be given to the parking offender.

Section 2. EXPEDIENCY CLAUSE. It is hereby adjudged and declared by the Sweet Home City Council that existing conditions are such that this ordinance is needed to be in effect at the time and date of its passage by the City Council and approval by the Mayor and it is hereby declaring an emergency to promote the public health, safety and welfare.

PASSED by the Council and approved by the Mayor this____day of _____, 2023.

_____
Mayor

ATTEST:

_____
City Manager - Ex Officio City Recorder

REQUEST FOR COUNCIL ACTION

Title:	Legislative Amendment LA22-02
Preferred Agenda:	February 14, 2023
Submitted By:	Angela Clegg, Associate Planner
Reviewed By:	Blair Larsen, CEDD Director Kelcey Young, City Manager
Type of Action:	Resolution ____ Motion _X___ Roll Call ____ Other ____
Relevant Code/Policy:	SHMC Chapter 17.75
Towards Council Goal:	Aspiration II: Effective and Efficient government; Goal 2.1: Update and Streamline Processes; Goal 2.2: Develop continuity in planning and permitting processes.
Attachments:	Draft Ordinance LA22-02 Staff Report Draft Planning Commission Minutes February 2, 2023

Purpose of this RCA:

The purpose of this RCA is to hold a public hearing regarding Legislative Amendment LA22-02 and present the application to the Council for approval. The purpose of this application is to adopt text amendment (LA 22-02) to the Zoning Ordinance, which will add Sweet Home Municipal Code (SHMC) Chapter 17.75 Mobile Food Units.

Background/Context:

This legislative amendment, LA 22-02, consists of a new Chapter to the Sweet Home Municipal Code (SHMC). The proposed amendment was identified by City Staff, based on feedback from the Planning Commission and an increase in requests to have Mobile Food Units throughout the City.

The following is a timeline of meetings associated with this project:

- December 22, 2022: Staff submitted the online PAPA.
- December 28, 2022: Notice Published in the New Era
- February 2, 2023: The Planning Commission held a public hearing on the proposed amendment. The Planning Commission moved to recommend approval of the amended Development Code to City Council.

At the February 14, 2023 Council Meeting, the City Council will hold a public hearing regarding this legislative amendment and conduct a first reading, and two more readings of the ordinance are necessary in order to adopt the ordinance.

The Challenge/Problem:

Should the City amend its Development Code in the manner recommended by the Planning Commission?

Stakeholders:

- City of Sweet Home Residents – The proposed text amendment benefit residents with a more clear and efficient code.
- Property Owners and Mobile Food Units Owners: Benefit from clear standards.
- Staff: Will be able to implement the SHMC with more efficiency and less discretion.

Issues and Financial Impacts:

This change will have no financial impact on the City.

Elements of a Stable Solution:

A stable solution involves adopting changes to the City's code that improve the quality of development for current and future mobile food unit owners, without overly burdening property owners and business owners in a way that is clear, consistent, and does not require significant staff interpretation. In addition, a stable solution would be consistent with the City's policies and goals.

Options:

1. *Approve application LA22-02 and conduct a first reading of the ordinance.*
2. *Deny application LA22-02 and direct staff and the Planning Commission to make revisions (specify).*
3. *Continue the public hearing to a later date to allow more time for the Council to examine the proposed changes or to provide staff time to prepare amendments or additional information (specify).*
4. *Take no action; leave the code as is.*
5. *Other*

Recommendation:

Staff recommends option 1: *Approve application LA22-02 and conduct a first reading of the ordinance.*

CITY OF SWEET HOME
ORDINANCE BILL NO. 7 FOR 2023
ORDINANCE NO. ____

AN ORDINANCE ADDING SWEET HOME MUNICIPAL CODE SECTION 17.75 MOBILE FOOD UNITS AND AMENDING THE SWEET HOME MUNICIPAL CODE §17.16.020, §17.18.020, 17.20.020, 17.25.020, and §17.26.020: MOBILE FOOD UNIT OR MOBILE FOOD UNIT POD, SUBJECT TO CHAPTER 17.75.

WHEREAS, the City of Sweet Home seeks to ensure the safety of Mobile Food Units placed within the City; and

WHEREAS, the Planning Commission held a public hearing on February 2, 2023 for the proposed amendments to Sweet Home Municipal Code §117.75, §17.16.020, §17.18.020, §17.20.020, §17.25.020, §17.26.020; and

WHEREAS, the Planning Commission followed the text amendment procedures under Sweet Home Municipal Code Chapters 17.116.020 Application and 2.20.90 Powers and Duties, and has provided a report to the City Council along with its recommendation to consider the proposed text changes; and

WHEREAS, the City Council held a public hearing on these proposed text changes on February 14, 2023; and

NOW THEREFORE,

The City of Sweet Home does ordain as follows:

Section 1. Sweet Home Municipal Code (SHMC) Chapter 17.75 titled Mobile Food Units is created to read as follows;

17.75 MOBILE FOOD UNITS

17.75.010 DEFINITIONS.

For the purposes of the mobile food unit (MFU) code, the following definitions apply. Terms, phrases, words, abbreviations, and derivatives used, but not specifically defined in this section, shall have the meanings commonly accepted in the community.

Mobile food unit - any vehicle that is self-propelled or that can be pulled or pushed down a sidewalk, street, highway, or waterway on which food is prepared, processed, or converted or which is used in selling and dispensing food to the ultimate consumer.

Mobile food unit pod - a group of two or more mobile food units on the same legal parcel of land as shown through the county records.

Property - legal parcel of land on which the MFU is located.

Tent - a structure, enclosure, umbrella structure, or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported in any manner except by air or the contents it protects.

Umbrella structure - a structure, enclosure, or shelter with or without sidewalls or drops, constructed of fabric or pliable material supported by a central pole or poles

Waste - any byproduct of the activities associated with the MFU including, but not limited, to blackwater, greywater, fats, oils, and grease.

17.75.020 GENERAL PROVISIONS

A. Purpose. The purpose of the mobile food units (MFU) code is to develop guidelines under which an MFU can establish business within the City of Sweet Home.

B. Conformity to State and County Laws. The MFU code shall be construed in conformity with the laws, licenses, and regulations set forth by the State of Oregon and Linn County regarding MFUs.

17.75.030 MFU OR MFU POD PERMIT REQUIRED.

A. Unless exempt or part of a permitted MFU pod, use of an MFU within the city limits of Sweet Home requires an MFU permit obtained from the City Manager or designee. An MFU permit shall not be required if exempt through SHMC 17.75.060.

B. Operation of an MFU pod within the city limits of Sweet Home requires an MFU pod permit obtained from the City Manager or designee.

17.75.040 PROPERTY AUTHORIZATION REQUIRED.

A property shall not be used by an MFU without an approved MFU property authorization application or site plan approval for a mobile food unit pod.

17.75.050 MOBILE FOOD UNIT PODS.

A. MFU pods are considered permanent installations and require site plan approval as identified in the Sweet Home Municipal Code prior to MFUs locating on the subject property.

B. Depending on the amenities and structures involved in the MFU Pod, additional authorizations or approvals may be required. MFU pods shall only operate when the entire site is in compliance with all local, state, and federal regulations.

C. Lighting. MFU Pods shall have lighting to ensure safe environment for customers and employees that complies with the following:
   1. At minimum, areas to be occupied by customers shall be illuminated when Units operate during hours of darkness.
   2. No direct light source shall be visible from the property line.
   3. Lighting fixtures shall be oriented and/or shielded to prevent glare on abutting properties.

D. All MFU and customer amenities within a Pod shall be served by a minimum five (5) foot wide hard surfaced, ADA compliant, walkway.

E. Waste and recycling receptacles shall be provided for customer and business waste. Receptacles shall be screened from view of the right-of-way and abutting residentially zoned properties and serviceable by the applicable waste hauler.

F. Accessory storage structures shall be less than 120 square feet in size and no greater than 15 feet in height. Storage structures shall be set back a minimum of 20 feet from public right-of-way. Setbacks for the accessory structures in the side and rear yards shall meet the minimum standards for accessory structures within the zone which the Pod is operating.

G. All MFU Pods shall have restrooms available. Required restroom shall be available during Pod operating hours. Restrooms must have handwashing

facilities with hot and cold running water, soap, and hand drying materials or devices. Restrooms must either be on-site or on an adjacent parcel with a signed agreement to allow Pod clientele to utilize the restroom facilities. On-site restroom shall be screened from view of the public right-of-way and abutting residentially zoned properties.

H. Parking shall comply with the standards listed in SHMC Chapter 17.44 Off-Street Parking and Loading.

17.75.060 EXEMPTIONS.

No part of this section is meant to be understood as removing the requirement of any state or county license. Nor is this section meant to be understood as removing the requirements of any other state, county, or city codes. MFUs shall maintain all valid state and county license(s) while in operation. Property owners and MFUs that do not require a permit shall still comply with all requirements of this chapter.

A. An MFU may operate within the Sweet Home city limits for no more than 3 days within any 30-day period without first obtaining an MFU permit.

B. MFUs which are closed to the public shall not be required to obtain an MFU permit.

C. An MFU may operate within any special event (such as a farmer's market or public festival) that holds a valid special event permit through the City of Sweet Home without an MFU permit.

D. Any event hosted by the City of Sweet Home is exempt from an MFU permit. The MFU shall complete any required application and obtain the proper approval directly from the specific City of Sweet Home department hosting the event.

E. An MFU in the public right-of-way is exempt so long as the MFU follows City of Sweet Home parking regulations and does not block pedestrian or vehicle traffic.

17.75.070 PERMIT AND APPLICATION FEES.

Permit and application fees for activities governed by this chapter shall be set by council resolution.

17.75.080 MFU POD PERMIT APPLICATION.

A. Application for MFU Pod permit will minimally contain:
   1. A scaled site plan of the property and proposed area the MFU will be located, to include at a minimum:
      a. A completed MFU Pod permit application form;
      b. A site plan including, but not limited to the following:
         1. Total square footage of area proposed for MFU use;
         2. Circulation plan of vehicle and pedestrian traffic onto, out of, and within the property;
         3. Location of MFU Pod amenities;
         4. Parking plan demonstrating compliance with all Sweet Home Municipal Code parking requirements once MFU is in place;
         5. Site layout demonstrating compliance with all setbacks, buffering, and separation requirements as specified in the Sweet Home Municipal Code (SHMC), Building Codes, and the Sweet Home Fire District (SHFD);

6. Utility connections for each unit (water, sewer, electrical, storm water, degreaser unit, etc.)

c. Details demonstrating compliance with the standards set forth in this chapter.

B. Additional information shall be provided by the applicant as required by the city manager or their designee.

C. Fees set through SHMC 17.75.070 shall be due when application is submitted and are nonrefundable.

D. An MFU Pod permit shall not expire, so long as the applicant and site are in compliance with the approved application.

E. If the applicant makes any changes to the requirements listed in SHMC 17.75.080(B) after an MFU Pod permit is approved, the permit shall be revoked and the applicant must apply for a new MFU Pod permit.

17.75.090 MFU PERMIT APPLICATION.

A. Application for a permit will minimally contain:
1. A completed MFU application form;
2. Site Plan.
3. Linn County Health Department License.
4. A copy of MFU's restroom agreement as required by Linn County (if no restroom is provided on site);
5. A copy of current proof of liability insurance;
6. Signed Proof of Placement Permission.
7. Method of waste disposal (liquid and solid). Disposal shall comply with SHMC Chapter 17.48 of the Sweet Home Municipal Code.

B. Copies of all necessary permits and agreements held for the county in which the permittee plans to operate. Additional information shall be provided as required by the city manager or their designee.

C. Fees set through SHMC 17.75.070 shall be due when application is submitted and are nonrefundable.

D. The MFU is limited to 1 year at a given site and/or address with an unlimited number of 1-year extensions. Each extension shall require a new permit.

17.75.100 MFU STANDARDS – ZONING.

Unless the property is approved as an MFU pod through the Sweet Home Municipal Code, MFUs shall only locate on properties within Commercial and Mixed-Use zones that are not used primarily for residential purposes.

17.75.110 MFU STANDARDS – GENERAL.

A. An MFU must not be a permanent structure and:
1. Shall remain operable and able to move;
2. Shall be properly licensed through the Oregon Department of Motor Vehicles;
3. Wheels can be removed but must remain on site.
4. Shall keep the tongue or other towing connection on site;
5. Shall not have permanent skirting or a base constructed around it;
6. Shall enclose or screen from view of the right-of-way and abutting residentially zoned property all accessory items not used by customers, including but not limited to, tanks, barrels, or other accessory items;

7. Shall not be missing siding or roofing;
8. Shall be kept in good repair and maintained in a safe and clean condition; and
9. Shall not exceed 15 feet in height.

B. An MFU shall only operate on an approved property under SHMC 17.75.040 or 17.75.050.

C. All MFUs, even those within MFU Pods, must maintain a 6-foot minimum clearance from any other MFU, structure or combustible item not integral to the MFU.

D. MFU operators shall pick up any paper, cardboard, wood, or plastic containers, wrappers, or any litter that is deposited by any person and which was generated from the MFU business from the ground of the property on which they conduct business and from all adjacent public rights-of-way.

E. An MFU may provide tent(s)/umbrella structure(s) for shelter to customers. The tent(s)/umbrella structure(s) shall have a minimum of seven feet of vertical clearance and be able to be closed or removed. All awnings must be flame resistant per Oregon Fire Code.
1. An MFU may provide 1 additional tent no larger than 12 feet by 12 feet, and 1 outdoor portable heating unit; provided, that both items are removed and stored within the MFU or other structure outside of operating hours.
    a. Shelter and heating unit must be maintained in working order with no defects that would hinder its intended use.
    b. Tents may have a maximum of 50 percent of the structure enclosed with walls or sides. Membrane structures may be fully enclosed.
2. Structures shall comply with all local and state agency regulations, including but not limited to Sweet Home Fire District, and Building regulations, and obtain all necessary permits and inspections prior to use of structure.

F. Any additional lighting shall be integral to the MFU.

G. Fences shall be constructed in compliance with SHMC Chapter 17.52.

H. Each MFU shall comply with the Oregon Fire Code, as interpreted by the Sweet Home Fire District.

I. An ADA accessible route shall interconnect the MFU, the restrooms, and any provided site elements such as seating, parking, or facilities.

J. An MFU shall remain in compliance with all applicable city, county, and state regulations.

17.75.120 MFU STANDARDS – UTILITIES.

A. A single MFU shall be fully contained or comply with the MFU Pod utility standards in Section B below. Electrical generators, if used, must comply with the following:
1. Generators shall be placed at least 10 feet from other buildings, structures, and combustibles.
2. Generator exhaust shall be directed away from the MFU, buildings, structures, and combustibles.

3. Generators shall be protected from contact by the public.
4. Generators shall not be operated within 300 feet of residential zoning, however inverter generators may be placed at 100 feet or greater from residential zoning, provided they are rated by the manufacturer to operate at 70 decibels or less.
5. Generators that are nonintegral to the MFU shall not be stored outside during nonoperating hours.

B. MFU Pod Utility standards:
1. Shall connect to the sanitary sewer consistent with applicable state plumbing codes and will included and approved grease interceptor for the disposal of fats, oils, and grease. Indirect discharge or leakage draining into the storm eater system is prohibited.
2. Shall connect to a permanent water source in conformance with the applicable state plumbing codes.
3. Electrical connection may be made via a permitted connection approved by the local electrical utility and the Linn County Building Department.
   a. Connection shall be made within 50 feet of an MFU.
   b. Connection shall be accessible for operation, maintenance, and inspection.
   c. Connection cables/cording shall be maintained in good condition.
   d. Electrical connections shall be covered by a cable protection ramp which has been rated for light vehicle traffic or greater and which has an anti-slip surface.
4. Electrical connection may be made via a power generator provided the following standards are met:
   a. Connection shall be made at a distance no more than 15 feet from the MFU while continuing to comply with all manufacturer guidelines.
   b. Connection cables/cording shall be maintained in good condition that allows for safe operation of the power generator.
   c. Electrical connections shall be covered by a cable protection ramp which has been rated for light vehicle traffic or greater and which has a non-slip surface.

C. All utilities shall be placed or otherwise screened, covered, or hidden from view of the right-of-way as to minimize visual impacts and prevent tripping hazards or other unsafe conditions.

17.75.130 MFU STANDARDS – SIGNAGE.

MFUs shall comply with SHMC Chapter 17.50.

17.75.140 FORMS AND CONDITIONS FOR MFU PERMIT AND MFU PROPERTY AUTHORIZATION

The permit and/or approval issued shall be in a form deemed suitable by the city manager or their designee.

A. MFU Permit. In addition to naming the MFU owner as permittee and other information deemed appropriate, the permit shall contain the following minimum conditions:

1. Each permit shall terminate 1 year after its issuance and may be renewed by submitting a new application and paying the required fee(s).
2. The issued MFU permit shall be personal to the permittee only and is not transferable in any manner. The permittee is responsible for compliance with all conditions of approval.
3. The permittee shall notify the city manager or their designee if they wish to modify an existing permit by submitting a new application under SHMC 17.75.030 along with the required fee(s).
4. The MFU permit shall be displayed in plain view of the public during operating hours.

17.75.150 MFU PERMIT RENEWAL.

MFU permits may be renewed an unlimited number of times.

17.75.160 PROHIBITIONS.

A. No temporary structures or storage containers shall be placed or erected on the property without prior approval from the City of Sweet Home. Any allowed temporary structure shall be maintained in good working condition free of holes, cracks, and/or defects.

B. Restrooms shall not be provided via chemical/portable toilet or privy.

C. MFUs shall not be parked in required landscape areas.

D. MFUs and amenities shall not be located in designated Clear Vision Areas.

E. No drive-through or drive-up service shall be permitted.

F. Direct or indirect operation of the MFU (i.e., customer line, table placement, sign placement, etc.) shall not be within, or block, the public right-of-way or access to the public right-of-way.

G. MFUs, including all items associated with their operation (items including but not limited to, cords, hoses, pipes, cables, or similar materials), shall not obstruct any required pedestrian pathways, bike paths, driveways, or drive aisles and shall be located so as not to create a traffic or safety hazard.

H. MFUs and/or objects associated with the Units shall not occupy fire lanes or other emergency vehicles access areas.

I. No dumping of waste is permitted into the city's storm drain system, public streets, or directly/indirectly onto the ground or pavement as outlined in SHMC Chapter 13.08.060.

17.75.170 RIGHT OF ENTRY – COMPLIANCE INSPECTIONS.

The city manager or their designee may enter upon a property which has an MFU that has established business, for the purpose of inspection of both the private property and MFU for continued compliance with this chapter.

17.75.180 DENIAL, REVOCATION, OR SUSPENSION OF PERMIT.

A. The city manager or their designee may deny, revoke, or suspend an MFU permit upon finding that any provision herein or condition of approval will be or has been violated.

B. Upon denial, revocation, or suspension, the city manager or their designee shall give notice of such action to the applicant or permittee in writing stating

the action that has been taken and the reason. The action shall be effective immediately.

C. Upon denial, revocation, or suspension of permit, the MFU shall either comply or depart within 2 days.

17.75.190 PENALTIES

Any violation of this chapter by any MFU owner or property owner shall be prosecuted under SHMC Chapters 9.36.

Section 2. Sweet Home Municipal Code §17.16.020 subsection M shall be created and read as follows: “Mobile Food Unit or Mobile Food Unit Pod, Subject to SHMC Chapter 17.75”.

Section 3. Sweet Home Municipal Code §17.18.020 subsection K shall be created and read as follows: “Mobile Food Unit or Mobile Food Unit Pod, Subject to SHMC Chapter 17.75”.

Section 4. Sweet Home Municipal Code §17.20.020 subsection X shall be created and read as follows: “Mobile Food Unit or Mobile Food Unit Pod, Subject to SHMC Chapter 17.75”.

Section 5. Sweet Home Municipal Code §17.25.020 subsection M shall be created and read as follows: “Mobile Food Unit or Mobile Food Unit Pod, Subject to SHMC Chapter 17.75”.

Section 6. Sweet Home Municipal Code §17.26.020 subsection B.11 shall be created and read as follows: “Mobile Food Unit or Mobile Food Unit Pod, Subject to SHMC Chapter 17.75”.

Passed by the Council and approved by the Mayor this ___ day of _____, 2023.

_____

Mayor

ATTEST:

_____

City Manager – Ex Officio City Recorder

City of Sweet Home
Community and Economic Development Department- Planning Program
3225 Main Street, Sweet Home, OR 97386 541-367-8113

Legislative Amendment (LA) 22-02

This legislative amendment, LA 22-02, consists of the new Sweet Home Municipal Code Chapter 17.75 Mobile Food Units (MFU), and a revision to the following sections and subsections: 17.16.020; 17.18.020; 17.20.020; 17.25.020; 17.26.020(B). The proposed text amendments were identified by City Staff, based on frequent requests to install MFU's and the lack of code to support the installation.

FILE NUMBER:	LA 22-02
REVIEW AND DECISION CRITERIA:	Sweet Home Municipal Code Section(s): 17.75, 17.16.020, 17.18.020, 17.20.020, 17.25.020, 17.26.020, 17.116.
PLANNING COMMISSION HEARING DATE &TIME:	February 2, 2023 at 6:30 PM
LOCATION:	City Hall Council Chambers 3225 Main Street, Sweet Home, Oregon 97386
CITY COUNCIL HEARING DATE &TIME:	February 14, 2023 at 6:30 PM
LOCATION:	City Hall Council Chambers 3225 Main Street, Sweet Home, Oregon 97386
STAFF CONTACT:	Angela Clegg, Associate Planner Phone: (541) 367-8113; Email: aclegg@sweethomeor.gov
REPORT DATE:	January 26, 2023

Staff has drafted the proposed ordinance based on the increase of interest and lack of code for Mobile Food Units. Staff researched Lebanon and Albany Mobile Food Unit codes, and used their codes as examples to draft the Sweet Home Ordinance. Staff revised sections 17.16.020, 17.18.020, 17.20.020, 17.25.020, and 17.26.020 to outright permit Mobile Food Units in zones Mixed Use (MU), Commercial Central (C-1), Commercial Highway (C-2), Recreation Commercial (RC), and Mixed-Use Employment (MUE).

Location

The proposed ordinance does include changes to the following zones to permit MFU's outright: 17.16.020 Mixed Use (MU), 17.18.020 Commercial Central (C-1), 17.20.020 Commercial Highway (C-2), 17.25.020 Recreation Commercial (RC), 17.26.020 Mixed-Use Employment (MUE).

Types

While the proposed ordinance is directed at Mobile Food Units, the only changes that it makes to the current development code are Sections 17.16.020, 17.18.020, 17.20.020, 17.25.020, and 17.26.020.

CITY OF SWEET HOME
PLANNING COMMISSION
MINUTES DRAFT

February 02, 2023, 6:30 PM
Sweet Home City Hall, 3225 Main Street
Sweet Home, OR 97386

WIFI Passcode: guestwifi
PLEASE silence all cell phones – Anyone who wishes to speak, please sign in.

Meeting Information

The City of Sweet Home is streaming the meeting via the Microsoft Teams platform and asks the public to consider this option. There will be opportunity for public input via the live stream. To view the meeting live, online visit http://live.sweethomeor.gov. If you don't have access to the internet, you can call in to 971-203-2871, choose option #1 and enter the meeting ID to be logged in to the call. Meeting ID: 947 077 522#

Call to Order and Pledge of Allegiance

The meeting was called to order at 6:30 PM

Roll Call of Commissioners

PRESENT
Henry Wolthuis
Jeff Parker
Todd Branson
Eva Jurney
Jamie Melcher
Laura Wood

STAFF
Blair Larsen, Community and Economic Development Director
Angela Clegg, Associate Planner

Public Comment. This is an opportunity for members of the public to address the Planning Commission on topics that are not listed on the agenda.

None

Meeting Minutes:

a) January 19, 2023 Meeting Minutes

A motion to approve the minutes as amended was made by Melcher, seconded by Wolthuis.
Voting Yea: 6
Voting Nay: 0

Public Hearings

Application LA22-02 - SHMC Chapter 17.75 Mobile Food Units

a) Application LA22-02 Staff Report & Draft Ordinance

The public hearing was opened at 6:34 PM.

Commissioner Parker asked of the Commission if there were any ex parte, conflicts of interest, or personal bias, there were none.

Associate Planner Clegg gave a history of the Mobile Food Unit code. She asked the Commission if they would like staff to read the entire draft ordinance or if they would like to just discuss the proposed code. CEDD Director Larsen explained the reasoning and gave examples of where the code would be used. Discussion of the code was decided on. Clegg explained the usage of the Lebanon and Albany codes as examples, and Larsen discussed differences. Clegg explained the current process for approving a mobile food unit. The Commission discussed the wheel criteria and chose to modify the standards. The Commission discussed the exemptions with staff. Commissioner Wood asked for clarification on the umbrella and tent criteria in Section 17.75.110(E). Larsen explained the intent of the code. Melcher asked if there is any Land Use review or noticing to neighbors. Clegg responded that there is not, but the MFU needs to be outrighted permitted in the proposed zone. Larsen discussed the ADA requirements that may govern the site play layout. There was further discussion about site layout criteria. There was discussion about criteria for MFU's serving alcohol. Clegg informed the Commission that alcohol booths would fall under the OLCC guidelines. Jurney proposed revisions to the definitions and asked for clarification of the right-of-way exemption. Larsen explained reasoning for the exemption. Wolthuis asked staff to explain what happens when an MFU closes for a temporary period. Staff explained the permitting and renewal process. There was discussion about how many days a food truck is allowed to operate before they obtain a permit. The Commission chose to amend 17.75.060(A) to read 3 instead of 2. The Commission asked to delete 17.75.110(A)(5) and revise 17.75.110(A)(3) to read wheels can be removed but must remain on site. Larsen discussed the steps for approval, and confirmed the changes suggested by the Commission.

Testimony in favor: none
Testimony in opposition: none
Neutral testimony: none

The public hearing was closed at 7:28 PM

A motion to approve Application LA22-02 as amended and recommend it to City Council was made by Melcher, seconded by Wood.
Voting Yea: 6
Voting Nay: 0

Sweet Home Municipal Code Carport Discussion

Clegg informed the Commission that she researched the carport criteria as requested by the Commission at the January 19, 2023 meeting. Clegg stated that the issue of carports and open storage brought up by Mr. Victor at the January 19th meeting are governed by different criteria. Clegg and Larsen discussed the findings with the Commission. The Commission discussed the matter. The Commission decided to leave the carport criteria as is. It was requested of staff to send a letter to Mr. Victor to inform him of the Commissions decision. The Commission discussed the open storage criteria and code enforcement process with staff.

Staff Updates:

Clegg gave an update on pending administrative applications.

Clegg gave and update on the code revisions and handed the Commissioners a revised Chapter 17.64 to replace in their code binders. The numbering format in 17.64 was incorrect on the printed sheets but is correct on the website.

Clegg asked the Commission if they would be willing to open the February 16th, 2023 Planning Commission meeting at 6:00 PM to allow for extra time for a work session. The Commission agreed to the time change.

Clegg and Larsen gave an update on the TSP committees and proposed meeting dates.

Larsen have an update on the Housing Needs Analysis and the possibility of a continuance of the Public Hearing at the February 16th Planning Commission meeting. Jurney and Parker stated that they will be absent for that meeting.

Staff discussed the open Planning Commission position. The applicant must live within the City Limits.

Round Table Discussions (Committee comments about topics not listed on the agenda)

None

Adjournment

The meeting was adjourned 8:23 PM.

_____

Jeffrey Parker Chairperson
Sweet Home Planning Commission

Respectfully submitted by Angela Clegg, Associate Planner

REQUEST FOR COUNCIL ACTION

Title:	Code Updates
Preferred Agenda:	January 24, 2023
Submitted By:	Blair Larsen, Community & Economic Development Director
Reviewed By:	Kelcey Young, City Manager
Type of Action:	Resolution ____ Motion _X___ Roll Call ____ Other ____
Relevant Code/Policy:	SHMC 8.04, 12.12, and 12.16
Towards Council Goal:	Aspiration I: Desirable Community; Goal 3.2: Community Safety
Attachments:	Ordinance Bill No. 4 for 2023 Code Updates

Purpose of this RCA:

The purpose of this RCA is to request approval and first reading of a proposed ordinance making various updates to the Sweet Home Municipal Code (SHMC) to protect the health, safety, and general welfare of the public.

Background/Context:

The City's Code Compliance Officer regularly receives complaints from the public regarding trash, junk, animals, fires, and other threats to public health and safety, as well as issues that affect the general appearance of the City. Many complaints, while valid, cannot be addressed due to constraints within the SHMC. Staff therefore, propose the following changes:

§8.04.020 Nuisances Affecting Public Health: references to debris or junk property are moved to a different section, as they are more pertinent to Open Storage

§8.04.025 Open Burning: this section is clarified to make it clear that authorized individuals have the right to extinguish illegal open burning and that the violator will bear the costs of such enforcement.

§8.04.060: this section is updated to include all windows and doors, not just those made of glass, and not just those at the bottom 6 feet of the structure.

§8.04.130: this section is updated to allow for the enforcement of open storage that is in public view from an alleyway or private street or shared driveway, as well as open storage in commercial and industrial areas (it was previously limited to residences).

§12.12.130: this section is updated to allow the City Manager's designee to enforce code provisions regarding domestic animals in parks. Previously, it was limited to the City Manager or Director.

§12.16.110: this section is updated to allow the City, at its discretion, to require the input of a licensed arborist for the abatement of dead, dangerous, or diseased trees on private property. This is helpful, because City staff do not have the expertise to determine the danger posed by trees, and residents often use the current code to demand action regarding their neighbors' trees.

The Challenge/Problem:

How does the City respond to resident complaints? How does the City adapt its Code over time?

Stakeholders:

- Sweet Home Residents – Residents deserve safe and attractive industrial and commercial areas and neighborhoods and streets.
- Sweet Home City Council – The City Council is responsible for enacting ordinances and regulations that protect the health, safety, and general welfare of the public.

Issues and Financial Impacts:

This ordinance involves no financial impact to the City, and will make enforcement more efficient.

Elements of a Stable Solution:

A stable solution includes reasonable updates to the SHMC that protect public health, safety, and general welfare.

Options:

1. *Do Nothing* – If the Council chooses to do nothing, then the City Code will remain as is.
2. *Motion to conduct a first reading of the proposed ordinance as presented*.
3. *Motion to conduct a first reading of the proposed ordinance with changes* – The Council may make changes to the proposed ordinance.
4. *Direct Staff to research other ways to accomplish the same goals*.

Recommendation:

Staff recommends option 2: *Motion to conduct a first reading of the proposed ordinance as presented.*

ORDINANCE BILL NO. 4 FOR 2023

ORDINANCE NO. ____

SWEET HOME ORDINANCE AMENDING VARIOUS SECTIONS OF THE SWEET HOME MUNICIPAL CODE

WHEREAS, Periodically updates to the Sweet Home Municipal Code are necessary to address citizen complaints and protect the health, safety, and general welfare of the public.

NOW THEREFORE,

The City of Sweet Home does ordain as follows:

Section 1. SHMC §8.04.020(B) is amended to read as follows:

B. *Garbage.* No person shall leave rubbish, garbage, trash, manure, or refuse located on property or sidewalks abutting thereon, and which has not been removed within a reasonable time, and which adversely affects or is detrimental to the health, safety or welfare of the public.

Section 2. SHMC §8.04.025(C) is amended to read as follows:

C. The Fire Chief or his or her designate or a police officer or Sweet Home Municipal Code Enforcement Officer is authorized to enforce this section under Sweet Home Municipal Code Chapter 9.36 pertaining to violations and any abatement or enforcement procedures. In addition to any other remedy, after requesting that a fire be extinguished by person(s) present, if any, the above-named individuals can proceed to extinguish the fire if his or her request is not complied with. Fires deemed by the Sweet Home Fire District to be dangerous to human life or property may be extinguished without warning to the violator. The cost of any enforcement, abatement or firefighting efforts shall be borne by the person in charge of the property as prescribed by this chapter with the notice and hearing being after the abatement.

Section 3. SHMC §8.04.060 GLASS OPENINGS is renamed DOORS AND WINDOWS and amended to read as follows:

No person shall allow a window or door in a structure to be left broken for more than 48 hours.

Section 4. SHMC §8.04.130 OPEN STORAGE AT RESIDENCES is renamed OPEN STORAGE and is amended to read as follows:

A. For the purposes of this section, open storage is defined as the accumulation of property for use when needed or later, or for disposal, in an area that is exposed to view from a public or private street, road, shared driveway, or alley. Unless otherwise stated in this chapter, items stored behind a solid or site-obscuring fence that is at least 6 feet tall are not considered open storage.

B. No person shall leave debris or junk anywhere within view of a public or private street, road, shared driveway or alley on the property or sidewalks abutting thereon.
C. No person shall leave oil, fuel, chemical barrels or similar containers exposed to public view from a public or private street, road, shared driveway or alley for a period in excess of three days. This section does not prohibit barrels, containers or tanks attached to a building and used as a reservoir for oil or fuel.
D. At residential properties:
    a. No person shall store parts of vehicles, machinery or equipment; lumber, plywood or building materials; buckets, cans or bottles; truck canopy, bikes or toys; household furniture and household furnishings manufactured, built or designed for inside use (out of the elements) and other personal property manufactured, built or designed for inside use or interior use (out of the elements); and personal property that is manufactured, built or designed for attachment to a structure as shutters, doors and windows, in front or street side yards at all, or interior side yards if a backyard is available for storage. “Yard”, for this subsection, shall include driveway.
    b. No person shall store an appliance (operable or inoperable) or plumbing fixture in view of a public or private street, road, shared driveway or alley.
    c. No person shall leave a burn barrel exposed to public view from a public or private street, road, shared driveway or alley when burn season is closed.
    d. No person shall store lumber, plywood or building materials in view of a public or private street, road, shared driveway or alley unless each type of item is stacked in a uniform formation one upon another with edges flush.
    e. No person shall leave accumulations of limbs, branches and/or brush on property for longer than one entire burn season that can be seen from a public or private street, road, shared driveway or alley. This section is in addition to any other provision of this chapter or other city ordinance and not a limit thereon. If other materials are included in the piles and are removed under another provision of the law, then the limbs, branches and brush can be removed, with the other materials per the other provision.
    f. No person shall park a motor vehicle or utility trailer in the front yard or street side yard for longer than 72 hours at any one time. “Yard”, for this subsection, does not include driveway. Abatement of the motor vehicle or trailer may be accomplished by following the procedures outlined in Chapter 10.16 or any amendment thereof for discarded vehicles.
E. At Commercial Properties:
    a. Where permitted under SHMC Title 17, equipment, materials, or merchandise for sale or rent may be displayed in a neat an orderly fashion; otherwise any open storage may only take place behind a site-obscuring fence.
F. At Industrial Properties:
    a. Open storage at industrial sites may only take place behind a site-obscuring fence.

Section 5. SHMC §12.12.130(C) and (D) are amended to read as follows:

C. The City Manager or designee can require the owner or caretaker of a domesticated animal to remove a domesticated animal from a park if necessary to prevent interference by the domesticated animal with the safety, comfort, or well-being of park visitors or resources.
D. No person shall have livestock in a park without first obtaining a permit for said livestock from the City Manager or designee.

Section 6. SHMC §12.16.110(C) is amended to read as follows:

C. *Removal*. The city may cause the removal of all, or part of any dead, dangerous or diseased tree located on private property that constitutes a hazard to life or property or harbors insect or disease which constitute a potential threat to other trees within the city, or may require the property owner to remove or trim any such tree on private property. At the discretion of the city, a licensed arborist may be consulted regarding the condition of potentially dangerous trees. Failure of the property owner to take corrective action within 30 days after receiving notice by the city is a violation of this chapter.

PASSED by the Council and approved by the Mayor this __ day of February, 2023.

_____
Mayor

ATTEST:

_____
City Manager - Ex Officio City Recorder

REQUEST FOR COUNCIL ACTION

Title:	Ordinance Amendment Concerning Personal Property
Preferred Agenda:	January 24, 2023
Submitted By:	Robert Snyder, City Attorney
Reviewed By:	Kelcey Young, City Manager
Type of Action:	Resolution___ Motion___ Roll Call___ Other_x__
Relevant Code/Policy:	SHMC Chapter 3.08 City Disposition Of Property
Towards Council Goal:	Goal 2 (1) Update and streamline processes and Goal 3(2) Improve community safety. Vision Statement I & II WE ASPIRE to have a desirable community and an effective and efficient local government.
Attachments:	Pictures of Old City Hall clean up sleeping area

PURPOSE FOR THIS RCA:

Presentation of an amendment to the SHMC in Ordinance form concerning items that have no apparent value or utility or in an insanitary condition coming into the possession of the city through its employees.

BACKGROUND/CONTEXT:

The City is making available an overnight sleeping area near the Sweet Home Police Department. From experience at the Old City Hall sleeping area the City needs to have effective and efficient ways of disposing of personal property for health reasons, safety reasons and the general welfare of the area users and the general public. Wording from ORS 195.505 that sets forth the procedures used in closing a homeless camping site state: “Items that have no apparent value or utility or are in an insanitary condition may be immediately discarded upon removal of the homeless individuals from the camping site.”

The proposed Ordinance incorporates the essence of the above wording in the City Disposition Of Property Ordinance that is currently in the SHMC Chapter 3.08 but makng it fit in with the wording used in the remainder of said Ordinance.

The said amendment would be effective at any time on public property where an employee of the city takes possession of the personal property in question and the named items or condition are found to exist not just at the overnight sleeping area. The original ordinance sets forth how the city is to dispose of personal property that for some reason comes into the possession of the city through its employees from returning it to

the owner, selling it after notice etc, to throwing it away. The amendment will provide an additional option to address problems with disposing of the said items.

THE CHALLENGE/PROBLEM:
Should the City of Sweet Home pass the proposed ordinance amendment?

STAKEHOLDERS

- Staff- for an ordinance provision that will be helpful in dealing with personal property on public property.
- City Council - for an effective remedy for certain personal property on public property.
- Citizens of Sweet Home - for effective and efficient local government.

ISSUES & FINANCIAL IMPACTS:
The financial terms of the proposed ordinance are dump fees.

ELEMENTS OF A STABLE SOLUTION:
Using the state law wording to address the local problem of personal property clean up on public property.

OPTIONS:

1. Do Nothing- Keep the current ordinance without the amendment.
2. Motion to conduct a first reading of the proposed ordinance as presented- If the voting is unanimous, a second reading, by title only, may take place during the same meeting.
3. Motion to conduct a first reading of the proposed ordinance with changes- The Council may make changes to the proposed ordinance. If the voting is unanimous, a second reading, by title only, may take place during the same meeting.
4. Direct Staff to research other ways to accomplish the same goals.

RECOMMENDATION:
Option 2 is the recommended option: Motion to conduct a first reading of the proposed ordinance as presented.

ORDINANCE BILL NO. 5 FOR 2023

ORDINANCE NO. 1310

SWEET HOME ORDINANCE AMENDING SHMC SECTION 3.08.070 PERTAINING TO INSANITARY PERSONAL PROPERTY WITH EXPEDIENCY CLAUSE

WHEREAS, The City of Sweet Home is providing a new overflow sleep area that based on past experience with said areas has to deal with personal property items, trash, litter and debris and needs regulations as soon as possible to help protect the area users and the public health, safety and welfare, therefore an expediency clause is included in this ordinance;

Now therefore,

The City of Sweet Home does ordain as follows:

Section 1. SHMC Section 3.08.070 is titled hereby to read as TREATMENT OF DANGEROUS OR PERISHABLE PROPERTY OR ANIMALS OR INSANITARY PROPERTY and the section is amended by dividing it into subsections A. and B. with subsection A. being the current wording of the section before this amendment and subsection B. being created to read as follows:

B. Notwithstanding any other provision of this chapter, any property that has no apparent value or utility or is in an insanitary condition may be immediately disposed of by the city, without notice, in such manner as is determined to be in the public interest, including throwing it away.

Section 2. EXPEDIENCY CLAUSE. It is hereby adjudged and declared by the Sweet Home City Council that existing conditions are such that this ordinance is needed to be in effect at the time and date of its passage by the City Council and approval by the Mayor and it is hereby declaring an emergency to promote the public health, safety and welfare.

PASSED by the Council and approved by the Mayor this 14th day of February, 2023.

_____
Mayor

ATTEST:

_____
City Manager - Ex Officio City Recorder


CH
Copper River



City of Sweet Home
Sweet Home Public Library
1101 13th Avenue
Sweet Home, OR 97386
541-367-5007

Sweet Home Public Library

Statistics

January 2023	**This month January 2023**	Last month December 2022	Year to date 2023	Previous year 2022(total)
Patron Activity				
Door Count	**2657**	2768	2657	30342
Program participants (all ages)	**126**	57	126	589
Total programs(all ages)	**8**	8	8	41
Circulation and Renewals				
Checkouts & renewals	**4546**	4813	4546	52702
E-audio & E-book checkouts	**525**	562	525	5692
Total items checked out	**5071**	5374	5071	58394
Public Computers				
Logins	**208**	221	208	2497
Resource Sharing Savings				
Cost savings	**4967.76**	4030.62	4967.76	35892.88
Items borrowed by consortium libraries	**261**	225	261	2949
Items borrowed from consortium libraries	**306**	214	306	2873
Volunteer Hours				
Hours worked by volunteers	**40**	53	40	528
New Library Patrons				
New patron cards issued	**74**	28	74	606

Events this month: In January we offered storytime and teen game afternoons. We had good turn out to each event. Our Community Reads event will have discussions on February 28th at 6pm and/or March 1 at 10am for the current selection of There, There by Tommy Orange.
Building updates: Some additional furniture has been ordered for the new book area and the teen room, funded by the Friends of the Library and a System of Care grant.
Items of note: We are close to officially announcing a contest to create a new library card design. Details will be available soon.

MEMORANDUM

TO: City Council
Kelcey Young, City Manager
Interested Parties
FROM: Blair Larsen, Community and Economic Dev. Director
DATE: February 14, 2023
SUBJECT: Community and Economic Development Department Report for January 2023

The Community and Economic Development Department (CEDD) consists of the City's Building, Planning, Engineering, Economic Development, Code Enforcement, and Parks and Recreation programs. The following is a summary of activities and notes on current projects from January 1st to January 31st, 2023.

1. BUILDING

- Summary of Building Program Permits Issued.

Permit Category	January, 2023	December, 2022	2023 YTD	2022 Total	2018-2022 Annual Average
Residential 1 and 2 Family Dwellings	0	0	0	36	27.4
Residential Demolition	0	1	0	9	8.4
Residential Manufactured Dwellings	0	0	0	2	11.6
Residential Mechanical Permits	5	8	5	100	106
Residential Plumbing	3	3	3	30	29
Residential Site Development	0	0	0	1	0.6
Residential Structural	1	3	1	54	51.8
Commercial Alarm or Suppression Systems	0	0	0	1	3.2
Commercial Demolition	0	0	0	2	3.4
Commercial Mechanical	0	1	0	17	17
Commercial Plumbing	0	2	0	5	9.8
Commercial Site Development	0	0	0	5	2.8
Commercial Structural	1	4	1	33	38.4
Total Permits	**10**	**22**	**10**	**295**	**309.4**
Value Estimate of All Permits	**$157,819.00**	**$277,996.00**	**$157,819.00**	**$30,928,533.31**	**$20,430,248.58**
Fees Collected	**$2,671.39**	**$6,693.47**	**$2,671.39**	**$336,902.20**	**$258,215.53**

- Developments of note: For your reference, below are some developments of note that were previously reported. Changes are noted with **bold text**.
    - Mosaic Memory Care Facility: Located on Mountain Fir Street next to the existing Mosaic-owned Wiley Creek Assistance Living Facility. The project received full planning approval early this year. Much of the time since then has been spent waiting for completed plans from Mosaic. However, plans were finally completed and reviewed in August, and a building permit has been issued. Construction is underway.
    - Samaritan Urgent Care Facility: The project has received full planning approval, building plans have been approved, and construction is underway.
    - Duck Hollow Phase III Subdivision: 51-lot single-family home subdivision located adjacent to the existing Duck Hollow Subdivision (41st Avenue and Long Street). This subdivision received planning approval in 2020, however there was a long delay due to wetlands regulations administered by the Oregon Department of State Lands. State approval has been granted, and construction is expected soon.
    - Live Oak Subdivision: 8-lot single-family home subdivision located between the two existing portions of Live Oak Street. The subdivision was approved in 2021, however the property changed hands, which delayed development. The construction timeline is unknown.
    - Foothills Ridge Subdivision: 21-lot single-family home subdivision located at the west end of Foothills Drive. This subdivision was approved in 2021, however the owner has run into delays with his engineering firm, and recently applied for an extension. Construction is expected next year.
    - Santiam River Development Phase 1 : 42-lot single-family home subdivision located at the north end of Clark Mill Road. Planning approval was granted at the beginning of this year, however some of the property is being sold to a different developer. It is unknown when construction will begin.
    - Clear Water Subdivision: 18-lot single-family home subdivision located on the west side of 45th Avenue, just north of Kalmia Street. Planning approval was granted in June. Initial construction has begun.

2. PLANNING

- Summary of Final Decisions of Planning Division Applications:

Application Type	January, 2023	December, 2022	2023 YTD	2022 Total	2018-2022 Annual Average
Annexations	0	0	0	1	0.4
Code Amendments	0	0	0	1	0.8
Conditional Use	1	0	1	11	8.8
Partition	1	5	1	17	12
Planned Development/ Subdivision	0	0	0	3	1.8
Property Line Adjustments	0	3	0	21	13.4
Vacation	0	0	0	0	0
Variance	0	0	0	3	3.6
Zoning Map Amendment	0	0	0	1	2.2

- 2 Land Use Applications was submitted in January.
- 2 Land Use Applications are pending final approval.
- 0 Fence Permits were issued in January.
- 1 Temporary RV Permits was issued in January.
- The City received a grant from the State to update our Transportation System Plan and create an Area Plan for the undeveloped land on the north side of the City. Staff and the consultant have begun work on the project.
- The City has also received a State grant for a Housing Needs Analysis (HNA). The consultant has been selected and will begin work soon. The purpose is to ensure that the City has both sufficient residential lands, and the proper mix of types and densities. This project is nearly complete, and a draft report will come before the City Council in the next month or two.
- The Planning Commission last met on February 2nd. The next scheduled meeting is February 16th, 2023.

3. ECONOMIC DEVELOPMENT

- Based on feedback from the Council at the June 28th work session, Staff are developing a Request for Proposals (RFP) for the quarry property that will outline all of the City's goals for the property and seek interest from developers for a public-private-partnership with the City. After Staff have finished a draft of the RFP, we will bring it to the Council for review, suggested changes, and, ultimately, approval.
- The Administration, Property, and Finance Committee met with some local property owners in June to discuss vacant buildings. One of the property owners, La Mota, is seeking to collaborate with the City on a project for their buildings that will bring traffic to the area and provide space for entrepreneurs to start businesses. Staff met with them and other property owners and interested parties in August to discuss the project. La Mota is working on some architectural designs. They previously indicated that they would bring some designs back to

City Staff in late September but have not yet supplied any. Staff is continuing to work with them to move the project forward.

4. CODE ENFORCEMENT

- Summary of Actions.

Case Status	January, 2023	December, 2022	2023 YTD	2022 Total	2018-2022 Annual Average
New Complaints	8	6	8	103	90.3
New Officer-Detected Violations	5	7	5	71	72.5
Violations Resolved	1	3	1	98	248.6
Complaints Noted with No Violation Found	4	3	4	23	22.8
Cases from Previous Month Resolved	16	N/A	16	N/A	N/A
Open Cases at End of Period	4	15	4	73	22.7
Citations	2	0	2	0	3
Abatements	0	0	0	3	1
Enforcement Type	**January, 2023**	**December, 2022**	**2023 YTD**	**2022 Total**	**2018-2022 Annual Average**
Animal	5	1	5	29	43
Blight	0	0	0	0	1
Illegal Burn	0	0	0	2	1.8
Illegal Dumping	0	0	0	1	0.6
Illegal Parking	0	0	0	6	9
Illegal Sign	0	0	0	0	2.2
Junk/Abandoned Vehicle	0	0	0	16	10.4
Minimum Housing	0	0	0	0	2.6
Occupying an RV	6	3	6	21	37.8
Open Storage	1	4	1	30	59.8
Other	1	2	1	7	18
Public Nuisance	0	0	0	6	40
Public Right-of-way	0	0	0	0	10.2
Tall Grass & Weeds	0	0	0	51	108.4
Vacant Lot	0	0	0	0	0.2

The City's Code Enforcement Officer responds to complaints submitted through the City's website, and actively patrols the City and works to resolve identified code violations.

5. PARKS

- The Park and Tree Committee will meet next on February 15th, 2023.
- Design work is now underway for Phase III of Sankey Park improvements, which focuses on the upper portion of the park.
- Design work is underway for a new park adjacent to City Hall. The Park will include a donated playground structure and dog park.
- A dog park is being constructed at Northside Park. The 6 lots that make up Northside Park have been consolidated into 1 lot, and fencing has been installed. The dog park is open to the public now, but additional improvements under construction, and a special 'grand opening' event is being planned for Arbor Day in the Spring.

6. OTHER PROJECTS

- Willow Street Neighborhood LID: Staff recently met with representatives of several state agencies at a "one stop" meeting and have a tentative plan for financing that will include a package of both forgivable loans and other loans with very attractive interest rates. Staff have submitted all the initial loan applications and are continuing to supply information to funding agencies to finalize the financing.
- The ODOT Foster Lake Sidewalk Project: Construction is nearly complete. Staff are working with the Railroad and ODOT on a plan to construct the portion that lies under the railroad trestle.
- Staff is working with ODOT on a pedestrian crossing at 22nd Avenue and Main Street. State Funding has been provided, and the project will be completed at little to no cost to the City. This improvement will be combined with an existing ODOT project to replace ADA ramps at intersections on Main Street. Construction on both the overall ramp replacement project and the pedestrian crossing is underway. The concrete has been completed for the crossing. The flashing beacons were installed in late September but were hit by a car and now need to be replaced. The costs of that replacement will not be borne by the City. The Council has approved an amendment to the IGA with ODOT to cover the pedestrian crossing. The crossing is not yet operational but is expected to be fully complete by Spring.
- CEDD Staff have been developing designs for the budgeted City Hall renovation and emergency generator installation. This project has been included in the budget for this fiscal year, and we will be preparing a request for proposals soon.
- CEDD Staff continue to provide key support for the efforts to create a managed homeless facility.

MEMORANDUM

TO: Kelcey Young, City Manager
FROM: Greg Springman, Public Works Director
DATE: February 14, 2023
SUBJECT: Public Works Activities Report – January 2023

This memorandum provides a brief periodic update of specific projects, WTP/WWTP O&M and Compliance status, and activities performed by the Public Works Department.

This table section summarizes work done on key maintenance activities.

Work Type	January, 2023	December, 2022	2023 YTD	2022	3 Yr Avg
Bathrooms/Garbage	11	8	11	168	360
Catch Basin Inspection/cleaning	0	0	0	3	13
Leaf Collection	1	548	1	1454	1105
Hydrant Flushing	0	2	0	200	276
Locates	38	6	38	498	479
Meter Re-Read	40	24	40	613	705
Mowing	0	0	0	117	95
Playground EQ Inspection	4	0	4	68	72
Pothole Repair	172	45	172	416	513
Sewer CCTV Miles	1.45	0	1.45	0.40	0.71
Street Sweeping Miles	112	84	112	1180	2072
Water Main Repair	0	0	0	11	12
Water Service Repair	2	0	2	38	30
Water Turn Ons/Offs	52	27	52	568	762
Total Completed Work Orders	**686**	**620**	686	**6790**	**7137**

WWTP and WTP Key Performance Indicators (KPIs)

	November, 2022	December, 2022	2023 YTD	2022	5 Yr Avg
Potable					
MG Treated	28.01	29.83	29.14	346.58	389.07
Backwash Water in MG	2.00	0.81	1.12	15.66	19.99
Ave daily demand in MG	0.93	0.96	0.94	0.95	1.07
Sanitary					
MG Treated	45.59	22.14	68.52	677.61	587.83
Max Daily Flow in MG	2.81	1.04	3.38	6.01	6.01
Average Flow in MG	1.52	0.71	2.26	1.86	1.61

MG is Million Gallons

Note: Sweet Home Wastewater treatment plant experienced 3 exceedances for the month of December 2022.

- 12/26/2022 we exceeded our pH lower limit of 6.3 with a 6.17 due to mechanical failure of caustic pump that has since been replaced
- For December Monthly Avg cBOD pounds we exceeded with 346.6 on a permit of 290.
- For December Monthly cBOD mg/L was 18.0 on a permit of 15 mg/L

Current & Upcoming Projects

Small Diameter Water Main Replacement

Scope: Engineer of Record and Staff has identified aged water mains throughout the 54 miles of water distribution system. Staff and West Yost will take a phase approach to replace the 5 miles of small diameter water mains.

Status: Project RFP bids from Contractors have been submitted. Staff awarded Project in September 2022. Construction to begin March, 2023.

Pleasant Valley Bridge Water Main Repair

Scope: Pac Excavation to repair a broken 12” water main, replace 22 pipe hangers, and provide additional supports inside Pleasant Valley Bridge.

Status: Pac Excavation repaired the water main in August, 2022. Project completed

Water Master Plan – West Yost

Scope: Develop Water Master Plan to support development.

Status: Water Master Plan is scheduled for completion in March 2023. West Yost working on final draft of the Water Master Plan.

Stormwater Master Plan – West Yost

Scope: Develop Stormwater Master Plan to support development

Status: Stormwater Master Plan is scheduled for completion in June 2023. Staff will provide updates as necessary.

Backwash Pump Evaluation – West Yost

Scope: Install backwash pump, utilizing the clearwell for filter backwashes and the corresponding effects on the distribution system and treatment.

Status: Project awarded to Pacific Excavation. Backwash pump has been back ordered, projected arrival date was changed from November 2022, until May 2023 due to back ordering from vendor. Project on schedule, other than the arrival of the backwash pump.

Finished Water Pump VFD Evaluation – West Yost

Scope: Evaluate feasibility to add a Variable Frequency Drive (VFD) to the current finish water pumps to maintain a constant level in clearwell to help facilitate backwash pumping.

Status: Project awarded to Pacific Excavation, with VFD installation coordinated with The Automation Group (TAG). Projected pump arrival date was changed from November 2022, until May 2023 due to back ordering from vendor.

Fluoride at WTP

Scope: Fluoride system at WTP has failed/End of life budgeted for replacement this FY23.

Status: Replacement parts have been received by TAG and will be programed prior to installation.

Water Meter Modernization

Scope: Replace water meters through the entire water distribution system.

Status: Public Works staff purchased 3000 Kamstrup Smart Ultrasonic water meters. Public Works staff has installed 2600 meters to date, project is 85% complete.

Wastewater Filter Belt Press

Scope: Filter Belt Press was installed in approx. 1974 and is an operational and financial challenge to keep operating, looking to prepurchase new dewatering equipment for the wastewater treatment plant as part of the upgrade project.

Status: PW staff currently working with Engineer of Record to confirm sizing of dewatering equipment.

MEMORANDUM

TO: CITY COUNCIL
FROM: Greg Springman, Steven Haney and Trish Rice
Public Works
DATE: February 3, 2023
SUBJECT: Mahler WRF Project Update

Public Works staff and our engineering consultant West Yost would like to keep City Council updated on the Mahler WRF Upgrades Project. This update will be provided on a monthly basis and contains the following sections:

Section 1. Project Overview and Current Status
Section 2. Project Schedule Update & City Council Engagement
Section 3. Project Budget Status Update
Section 4. Updates on Key Issues

1. PROJECT OVERVIEW AND CURRENT STATUS

MWRF Interim Improvements Project (MWRF IIP)

Following City Council authorization, Staff are proceeding with implementation of the MWRF IIP to address current MWRF operating challenges and help to fully utilize $7 Million in grant funding provided to the City by the Oregon Legislature that must be spent by June 30, 2023.

Work on the MWRF IIP is progressing quickly. Bids for three (3) initial competitive bidding packages have been received and are proceeding through the award and contracting process. These bid packages include:

Package 1 - Owner-Supplied Electrical Equipment Pre-Purchase: Standby Generator and Main Switchboard to be procured by The Automation Group as the City's Integrator-of-Record.

Package 2 - Owner-Supplied Dewatering Equipment Bid Documents: The City will pre-purchase a new screwpress solids dewatering system that will initially be located near the existing Solids Building before ultimately being relocated to the Dewatering Building as part of the major MWRF expansion.

Package 3 – Sludge Blend Tank Design-Build Bid Documents: The City will hire a Design-Build Contractor to install a new 100,000 gallon concrete tank that will be used to store solids in the near-term that will also be utilized as the sludge blend tank as part of the MWRF expansion.

Staff and Engineers are also completing final design for the MWRF IIP Site Improvements required for installation of equipment, piping and site work related to the 3 bid packages summarized above. These projects are anticipated to be completed by the June 30, 2023 grant funding deadline.

MWRF Improvements Project

West Yost's design team has completed and delivered 60% Design Contract Documents for the larger MWRF Improvements Project. Staff are currently reviewing nearly 500 drawings and 2 volumes of specifications with comments due back to the City on February 7, 2023. The most Engineer's Opinion of Probable Construction Cost (OPCC) for the MWRF Improvements Project is **$56,813,000**. Staff are working on securing the additional funding needed to construct the project.

2. PROJECT SCHEDULE UPDATE & CITY COUNCIL ENGAGEMENT

Below is the current project schedule for the MWRF IIP and larger MWRF Improvements Project.

	2022			2023				2024	2025	2026
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1 – Q4	Q1 – Q4	Q1 – Q4
MWRF Interim Impr. Project (IIP)										
MWRF Impr. Project										
Planning & Design				Bidding & Contracts				Construction		

Following are current Requests for Council Actions (RCA):

Upcoming Requests for Council Action (RCA) are summarized in this section to give City Council advance notice of anticipated City Council engagement related to the MWRF Improvements Project.

<u>February 14 City Council Meeting Requests for Council Action:</u>

If recommended by Staff, the Recommendations of Award for the MWRF IIP contracts will be presented to City Council by Staff, including:

1. Owner-Supplied Electrical Equipment Pre-Purchase Contract Documents
2. Owner-Supplied Dewatering Equipment Contract Documents
3. Sludge Blend Tank Design-Build Bid Contract Documents

West Yost contract amendment for engineering services to complete Final Design and Bidding for the MWRF Improvements Project.

<u>March 14 City Council Meeting Requests for Council Action:</u>

If recommended by Staff, the Recommendation of Award for the MWRF IIP Site Interim Improvements Project civil and site work for installation of pre-purchased equipment and associated improvements.

<u>Future City Council Requests for Council Action:</u>

Future City Council engagement and Requests for Council Action are anticipated as follows:

- 3rd Party Special Inspections and Testing Services Contract Award – RCA timing TBD
- Electronic Construction Document Control System Contract Award – RCA timing TBD
- MWRF Improvements Project Bid Award – RCA timing TBD

3. PROJECT BUDGET STATUS UPDATE

The following budget status updates provide a high-level review of contract amounts and expenditures for engineering services, Owner-supplied electrical equipment, Construction, 3rd Party Special Inspections and Testing, and the Electronic Construction Document Control System.

a. Construction

The three initial MWRF IIIP contracts are being finalized with anticipation that work on the new Sludge Blend Tank will begin soon. Draft final CDs for the MWRF IIP Site Improvements contract have been submitted by West Yost and are being reviewed by Staff. Staff anticipate the IIP Site Improvements Project will begin advertisement this week.

b. Owner-Supplied Electrical Equipment

Contracts for Owner-Supplied Electrical Equipment by The City's Integrator-of-Record are being finalized so ordering can begin.

c. 3rd Party Special Inspections and Testing Services

Budget status updates for 3rd Party Special Inspections and testing will be provided once construction activities begin.

d. Electronic Construction Document Control System (ECDCS)

Budget status updates for ECDCS will be provided once construction activities begin.

e. Engineering Services

West Yost submitted the MWRF Improvements Project 60% Design Contract Documents on January 31st and Staff are now completing review. West Yost has submitted a proposal for complete final design for the project by June 30, 2023.

Firm	Dates	Purpose	Contract Amount	% Complete
Murraysmith (1)	2018 – 2021	Preliminary and Final Design	$2,134,373	100%
West Yost	Jul 2021	Final Design Review	$66,224	100%
West Yost (2)	Aug 2021 – present	Project Planning. Permitting, Preliminary and Final Design	$3,141,280	92%
West Yost (3)	Oct. 2023 thru Oct. 2026	Engineering Services During Construction (ESDC)	$879,670	0%

(1) Contract Amount listed is actual amount paid to Murraysmith by City. This amount is being confirmed.

(2) West Yost's current Mahler WRF design contract is for completion of Phase 1 final design and Phase 2 60% Design. It is anticipated a contract for completing MWRF Improvements Project final design will be executed in Q1 2023.

(3) West Yost's current Mahler WRF Engineering Services During Construction (ESDC) contract was for Phase 1 construction. If authorized, a portion of this current contract will be used for MWRF IIP ESDC. The balance would be used for initial ESDC on the larger MWRF Improvements Project.

4. UPDATES ON KEY ISSUES

- **Preliminary Engineering Report (PER) Update.** Concurrent with design of the MWRF IIP and completion of 60% final design for the MWRF Improvements project, West Yost's team is also working on updating the Preliminary Engineering Report (PER) required for obtaining USDA funding for the project. The PER will be submitted to USDA and Oregon DEQ for review and approval. This PER update will incorporate the recently updated construction cost estimate (Engineers OPCC).
- **Outfall Permitting and "Crosscutters".** West Yost met with DEQ to discuss the mixing zone study for the new South Santiam River outfall and continues to work with Pacific Habitat on the Environmental Assessment (EA) and Biological Assessment (BA) that have been determined to be required for the project.
- **MWRF Improvements Project Funding.** Staff are now meeting on a monthly basis with representatives from USDA, DEQ and Business Oregon to discuss project funding. The DEQ Regional Solutions Team (RST) is also engaged on the project and in these meetings.
- **Expenditure of Oregon Legislature Funding.** Contracts for the three (3) MWRF IIP project elements are being finalized and staff are reviewing final design for the MWRF IIP Site Improvements Project that are anticipated to start bidding on February 9th. West Yost has submitted a proposal to complete final design of the larger MWRF Improvements Project. These are all elements of the City's plan to utilize the $7M in grant funding awarded by the Oregon Legislature and required to be spent by June 30, 2023.

Cc: Dept. Heads