CITY OF LA PINE, OREGON
REGULAR CITY COUNCIL MEETING

Wednesday, March 10, 2021 at 5:30 PM
La Pine City Hall: 16345 Sixth Street, La Pine, Oregon 97739

The meeting location is accessible to persons with disabilities. A request for an interpreter for the hearing impaired or for other accommodations for persons with disabilities should be made at least 48 hours before the meeting to City Hall at (541-536-1432). For deaf, hearing impaired, or speech disabled dial 541-536-1432 for TTY.

AGENDA

CALL TO ORDER

ESTABLISH A QUORUM

PLEDGE OF ALLEGIANCE

PUBLIC COMMENTS

Three (3) minutes per person; when asked to the podium, please state your name and whether you live within La Pine city limits.

ADDED AGENDA ITEMS

Any matters added to the Agenda at this time will be discussed during the "Other Matters" portion of this Agenda or such time selected by the City Council

CONSENT AGENDA

Information concerning the matters listed within the Consent Agenda has been distributed to each member of the City Council for reading and study, is considered to be routine, and will be enacted or approved by one motion of the City Council without separate discussion. If separate discussion is desired concerning a particular matter listed within the Consent Agenda, that matter may be removed from the Consent Agenda and placed on the regular agenda by request of any member of the City Council.

1. Meeting Minutes 02.24.2021

OTHER MATTERS

Only Items that were previously added above in the Added Agenda Items will be discussed.

2. Introduction of John N. Morgan - Contract Planner
3. Applications for Council
   a. Ms. Cathi Van Damme
   b. Ms. Courtney Ignazzitto
   c. Ms. Jeannine Earls

d. Ms. Janice Curtis-Thompson

4. Habitat for Humanity SDC Request - Discussion
5. Anderson Perry - La Pine High School Senior Scholarship
6. La Pine Transit Center
7. City Manager Report

PUBLIC COMMENTS

Three (3) minutes per person; when asked to the podium, please state your name and whether you live within La Pine city limits.

STAFF COMMENTS

MAYOR & COUNCIL COMMENTS

ADJOURNMENT

OPEN EXECUTIVE SESSION

EXECUTIVE SESSION

The public will not be permitted to attend the executive session; provided, however, representatives of the news media and designated staff will be allowed to attend the executive session. Representatives of the news media are specifically directed not to report on any of the deliberations during the executive session, except to state the general subject of the executive session as previously announced. No decision will be made in the executive session.

CALL TO ORDER

ESTABLISH A QUORUM

ITEMS FOR DISCUSSION

ADJOURN EXECUTIVE SESSION

Pursuant to ORS 192.640: This notice includes a list of the principal subjects anticipated to be considered or discussed at the above-referenced meeting. This notice does not limit the ability of the City Council to consider or discuss additional subjects. This meeting is subject to cancellation without notice. The regular meeting is open to the public and interested citizens are invited to attend.

CITY OF LA PINE, OREGON
REGULAR CITY COUNCIL MEETING

Wednesday, February 24th, 2021 at 5:30 PM
La Pine City Hall: 16345 Sixth Street, La Pine, Oregon 97739

MINUTES

1. CALL TO ORDER

Meeting was called to order at 5:31 p.m.

2. ESTABLISH A QUORUM

PRESENT
Mayor Daniel Richer
Councilor Colleen Scott
Councilor Mike Shields
Interim Councilor Don Greiner

Student Councilor Max Miller

STAFF
City Manager Geoffrey Wullschlager
Public Works Manager Jacob Obrist
Assistant Planner Alexa Repko
City Recorder Robin Neace
Office/Account Clerk Jamie Kraft

3. PLEDGE OF ALLEGIANCE

4. RESIGNATION OF Alisha Powell

Resignation received from Councilor Alisha Powell. She is relocating out of the State.

Motion made by Colleen Scott to accept resignation, Seconded by Mike Shields.

Voting Yea: Councilor Scott, Councilor Shields, Councilor Greiner

5. PUBLIC COMMENTS

Three (3) minutes per person; when asked to the podium, please state your name and whether you live within La Pine city limits.

No Public Comments.

6. ADDED AGENDA ITEMS

Any matters added to the Agenda at this time will be discussed during the "Other Matters" portion of this Agenda or such time selected by the City Council.

Councilor Scott requested that the February 10th, 2021 minutes be amended to note the appointment process of Interim Councilor Don Greiner. Mr. Greiner was appointed and sworn in by Council to serve in the place of D. Scott Henderson who resigned from the council for personal reasons.

7. CONSENT AGENDA

Information concerning the matters listed within the Consent Agenda has been distributed to each member of the City Council for reading and study, is considered to be routine, and will be enacted or approved by one motion of the City Council without separate discussion. If separate discussion is desired concerning a particular matter listed within the Consent Agenda, that matter may be removed from the Consent Agenda and placed on the regular agenda by request of any member of the City Council.

1. 02.10.2021 Regular City Council Meeting Minutes

Motion made by Councilor Shields, Seconded by Councilor Greiner.

Voting Yea: Councilor Scott, Councilor Shields, Councilor Greiner

Voting Nay: None

8. Habitat for Humanity – Presentation

Wade Watson, Director of Development and Construction Programs for La Pine/Sunriver Habitat for Humanity gave a power point presentation to the Council requesting consideration for a waiver of City of La Pine System Development charges for the current fiscal year. There was discussion and questions from the Council regarding other cities providing exemptions such as Bend, Tillamook, and Portland suburbs. It was agreed by consensus to add the discussion to the next city council agenda.

9. CITY MANAGERS REPORT

1. City Manager, Geoff Wullschlager gave an overview of items contained within his report.

10. OTHER MATTERS

Only Items that were previously added above in the Added Agenda Items will be discussed.

11. PUBLIC COMMENTS

Three (3) minutes per person; when asked to the podium, please state your name and whether you live within La Pine city limits.

12. STAFF COMMENTS

Public Works – Jacob Obrist reported that spring 2021 is preparing to be the busiest spring on record. Public Works staff Dylan Gardner and Branden Bren recently participated in Waste-Water Certification training at City Hall provided by Association of Water Utilities.

Planning – Assistant Planner Alex Repko Planning is very busy with various applications and has conducted several preapplication meetings. A new contract planner will soon be available to assist with the sharp increase in activity.

Administration – Robin Neace expressed a farewell to the council upon attending her last council meeting.

13. MAYOR & COUNCIL COMMENTS

Councilor Scott – Expressed disappointment in the lack of an RFP for the transit center.

Councilor Greiner – Expressed thanks to Student Councilor Max Miller for updating the council on activities at La Pine High School.

Mayor Richer – Thanked Robin Neace for her service to the city. Also expressed his support of the contract planner and potentiality of an in-house city engineer.

14. ADJOURNMENT

Meeting adjourned at 6:16 p.m.

LA PINE
OREGON

LA PINE CITY COUNCILOR APPLICATION

Catherine Renee VanDamme (Cathe)
Applicant's Full Name

52724 Elm Drive, La Pine, OR 97739
Street Address

P.O. Box 382, La Pine, OR 97739
Mailing Address

N/A | N/A | 503-348-4869
Home Phone | Work Phone | Cell Phone

scvandamme@gmail.com
Email Address

Retired - Education | N/A
Current Occupation | Present Employer

Occupational/Educational Background	Degrees	Years in this Field
Secty/Admin. Asst.	Portland Pub. Schools	(20 years)
" Business -	Multnomah ESD	5 years
Procurement (Purchasing)	Card Admin.	4 years
~~HR~~ Safety/Training Supv.	Portland Public Schools	1 year

On a separate sheet(s), please type or print legibly answers to the following questions:

(See attached)

1. Why do you want to be a City Councilor?
2. What talents, skills, or abilities would you bring to the City Council?
3. What are your expectations for the City?
4. Are you willing to serve on subcommittees and/or represent the City in regional or community meetings?
5. How much time can you devote to this position on a monthly basis?_____hours

I am a resident of the City of La Pine and will have been a resident within city limits for at least one year prior to appointment. To the best of my knowledge, the information contained in this application is true and accurate.

Date: 3/1/21 **Signature:** Cathe VanDamme

Please return application to La Pine City Hall located at 16345 Sixth Street or mail to City of La Pine, PO Box 2460, La Pine, OR 97739

City Of La Pine
City Council Members
PO Box 3055, 16345 Sixth Street
La Pine, Oregon 97739

February 28, 2021

Hello to each of you!

I am Cathi VanDamme. I ran for City Council in November of 2020, however I failed to receive the necessary votes to fill one of the two open positions! That said, I wanted to reach out to each of you via this letter.

I don't have a high dollar background but have worked along-side many who do. Let me explain my reasons for wanting to be part of the City Council for the City of La Pine.

I have a great desire to better the location where I live, regardless of where that is! You can see by my application that I have spent many years volunteering my time in the neighborhoods where I have lived.

I am one who desires to improve the livability for those living within the City of La Pine as well as to provide the necessary planning and welcome for those who visit this great place! They may someday decide to move here just as so many of us have because of its beauty and relaxing way of life. We are a young city in Oregon who is growing so much faster than perhaps expected...yet why not?

We can build upon the mindset of La Pine's early pioneers! They struggled and fought just to survive. To build their dreams into reality by building a community of folks wanting their own place in Central Oregon. Like La Pine today, many were and are, willing to help when the call goes out. Let us not forget their hard work as we continue to grow with the influx of people looking for HOME, not far from the beauty of lakes, rivers and outdoor activities that make La Pine the beautiful and desirable place that it is.

This is the time for us to prepare (maybe to say, catch up) with what is happening in our lovely space. Although a good thing, we need to continue planning and building the necessary infrastructure that will help us grow and accept this influx of people and the building it will bring by setting our sights on what the city will look like in the future.

I truly desire to be a member of this Council. I bring with me an expectation that I will add insight and years of civil service experience that will serve this community well.

Thank you for your consideration!

Cathi VanDamme

Cathi VanDamme

Catherine (Cathi) VanDamme

PO Box 382, La Pine, OR| 503-348-4869 | scvandamme@gmail.com

Why my desire to serve as City Council Member?

I enjoy being involved in the community, as well as with the city, to lend my expertise in any way I can.

I have several years of experience enlarging my civic responsibilities by serving as community liaison to the city, neighborhood association chair, as well as a Board Director of a PUD.

Caufield Assn. of Neighbors, Oregon City, OR, (2000 – 2004)

North Central assn. of neighbors, Gresham, OR, (2006 – 2008)

Elected Board Director, Chair and officers as needed, Rockwood Water PUD, Gresham, OR 12,000-15,000 services, (2008 – 2016)

City of La Pine Public Works Committee, (2017 – Present)

City of La Pine Planning Commission, (2019 – Present)

I feel a City Council position important for me as I have a strong desire to continue serving in capacities that build upon the decisions being made for continuing future planning for the City of La Pine. This is an important era for our city and its need to prepare for the influx of new people. I believe I would be a positive asset to the Council and the citizens of La Pine during this time.

What talents, skills, or abilities would you bring to the City Council?

My career and outside responsibilities have afforded me the necessary skill of communicating with personalities of all types. Including those who are quick to anger, outspoken and/or violent during City Meetings, Board Meetings and general neighborhood meetings. I treat those folks respectfully while expecting respectful behavior from them in return. My career in education has afforded me the ability to work with people with varying and differing opinions and hear them out and then discuss what the best options might be for any given situation. I have given talks and trainings in conferences across this nation in my roles of Procurement Card Administrator and that of Student Transportation Safety/Training Supervisor with additional skill at speaking to large groups.

I am an organized individual who does research before making decisions and bases those decisions on the purpose of them and how they will improve the needs of the city. I am one who does not let the ball drop without following through.

What are my expectations for the City?

Recruit Businesses that will improve the purchasing experience for the citizens of La Pine without the need to drive to Bend as often as is currently necessary. To bring in restaurants improving livability for the city as well as for those passing through. To further develop an infrastructure, including to build budgets for future projects, such as road improvements and maintenance, future policing and code enforcement, continue with the water and sewer projects to include installing fire hydrants, etc., improve street lighting in neighborhoods without any lighting. To provide a better quality of life for the citizens of and surrounding La Pine.

Are you willing to serve on sub committees and/or represent the City in regional or community meetings?

Absolutely! I am very qualified to serve and/or represent the City in meetings as needed. I have served on Portland Dept. of Transportation committees as well as necessary committees pertaining to the PUD.

How much time can you devote to this position on a monthly basis?

I can and will devote as much time as is necessary to accomplish the goals of the position and the Council.

LA PINE
OREGON

LA PINE CITY COUNCILOR APPLICATION

Courtney Ignazzitto
Applicant's Full Name

51215 Riley Ln, La Pine, OR 97739
Street Address

PO Box 3193, La Pine, OR 97739
Mailing Address

Home Phone | Work Phone | 541-410-6970 Cell Phone

Czitto11715@gmail.com
Email Address

Executive Assistant & Public Relations
Current Occupation

La Pine Community Health Center
Present Employer

Occupational/Educational Background	Degrees	Years in this Field
Marketing Assistant		5
Report Analysis		2

On a separate sheet(s), please type or print legibly answers to the following questions:

1. Why do you want to be a City Councilor? I want to be part of the future of our community + bring a young, fresh perspective.
2. What talents, skills, or abilities would you bring to the City Council?
   Marketing ideas, Organization, Communication
3. What are your expectations for the City?
   Help me to learn the information that's necessary for the position.
4. Are you willing to serve on subcommittees and/or represent the City in regional or community meetings?
   Yes. I am willing to serve as needed
5. How much time can you devote to this position on a monthly basis? 5-7 hours

I am a resident of the City of La Pine and will have been a resident within city limits for at least one year prior to appointment. To the best of my knowledge, the information contained in this application is true and accurate.

Date: 3/5/21 **Signature:** Courtney Ignazzitto

Please return application to La Pine City Hall located at 16345 Sixth Street or mail to City of La Pine, PO Box 2460, La Pine, OR 97739

LA PINE
OREGON

LA PINE CITY COUNCILOR APPLICATION

Qeannine Ann Earls
Applicant's Full Name

51511 Hwy 97 La Pine, OR 97739
Street Address

PO Box 2753 La Pine OR 97739
Mailing Address

541 480 4799
Home Phone | Work Phone | Cell Phone

highlanderwife@aol.com
Email Address

Business Owner — Self
Current Occupation — Present Employer

Occupational/Educational Background	Degrees	Years in this Field
College - Professional Careers Medical Office Mgmt		20

On a separate sheet(s), please type or print legibly answers to the following questions:

1. Why do you want to be a City Councilor? Serve my Community.
2. What talents, skills, or abilities would you bring to the City Council? I am very organized.
3. What are your expectations for the City? To grow but keep our Community feel.
4. Are you willing to serve on subcommittees and/or represent the City in regional or community meetings? Yes
5. How much time can you devote to this position on a monthly basis? 10? hours

I am a resident of the City of La Pine and will have been a resident within city limits for at least one year prior to appointment. To the best of my knowledge, the information contained in this application is true and accurate.

Date: 3/1/2021 **Signature:** [signature]

Please return application to La Pine City Hall located at 16345 Sixth Street or mail to City of La Pine, PO Box 2460, La Pine, OR 97739

LA PINE
OREGON

LA PINE CITY COUNCILOR APPLICATION

Janis Elaine Curtis-Thompson
Applicant's Full Name

51797 Fordham Drive
Street Address

51797 Fordham Drive
Mailing Address

Home Phone | Work Phone | 971-404-7945 Cell Phone

janiscurtis@msn.com
Email Address

Retired
Current Occupation | Present Employer

Occupational/Educational Background | Degrees | Years in this Field

BA in Liberal Arts with a focus on History and Religion

Please see attached letter - Resume available on request

On a separate sheet(s), please type or print legibly answers to the following questions:

1. Why do you want to be a City Councilor?
2. What talents, skills, or abilities would you bring to the City Council?
3. What are your expectations for the City?
4. Are you willing to serve on subcommittees and/or represent the City in regional or community meetings?
5. How much time can you devote to this position on a monthly basis? 10-15 hours

I am a resident of the City of La Pine and will have been a resident within city limits for at least one year prior to appointment. To the best of my knowledge, the information contained in this application is true and accurate.

Date: 3/8/2021 **Signature:** Janis Curtis-Thompson

Please return application to La Pine City Hall located at 16345 Sixth Street or mail to City of La Pine, PO Box 2460, La Pine, OR 97739

March 7, 2021

La Pine City Hall
16345 Sixth Street
La Pine, LR 97739

Attn: City Manager

Greetings:

My name is Janis Curtis-Thompson and I am interested in obtaining a position on the La Pine City Council. My husband and I have lived in Crescent Creek subdivision for the last four years. I have been a resident of Oregon in the Beaverton and Banks area since 1976 except for a short time spent in the southwest with my elderly mother.

My desire to be on the La Pine City Council is driven by both a personal and professional desire to contribute to something greater than myself. First and foremost, I see La Pine developing and growing and I feel my background and experience can effectively contribute to this undertaking (enterprise). Issues that have come to my attention revolve around the need for economic and business development, affordable housing, sustainable and growable infrastructure (utilities, roads, land use) and a burgeoning tourist trade. I would think moving from a county governance to city governance offers certain challenges but also a flexibility at this point in the city's growth.

From my perspective La Pine is at a unique crossroads. It is on the map and emerging. Further La Pine is not hindered by lot size or an urban growth boundary. The question becomes what short- and long-term decisions must be addressed. These present decisions will dictate La Pine's future and its ability to direct it responsibly.

It is my instinct that we compete with Bend and Sunriver in tourism due only to the proximity of the Deschutes River. But we are far superior when one looks at housing prices, population density issues, traffic congestion and an open, rural, friendly township feeling that encourages local involvement. As I talk with new residents this is what brings them here. I believe that we will continue to be a bedroom community to Bend, and that is a good thing from a tax perspective. La Pine has and will continue to develop on its own merits if we create a good and open environment which supports industry, housing, and tourism. La Pine should focus on high tech manufacturing and data centers, local tourism businesses and accommodations which in turn will drive a job market for a qualified workforce.

I have a rich knowledge and understanding of the High-tech industry where I spent 20 years in Computer Services, Sales Support, Operations, Marketing and Account Management. I understand service and the needs that drive this industry and I know that it is a commercial development that could successfully be supported here in La Pine. I have strong written and verbal communications skills that go hand-in-hand with sales and marketing and getting the point across. My husband was a CPA and therefore I have worked in the accounting environment for seven years. I have taken on the role of a long-term substitute teacher when in the southwest. I am willing to work on subcommittees because I believe that is where the real work takes place and details are hammered out. My present understanding of the office leads me to believe that this position would require 10-15 working hours a month.

Respectfully,

Janis Curtis-Thompson

Janis Curtis-Thompson

LA PINE
OREGON

CITY OF LA PINE

16345 Sixth Street — PO Box 2460
La Pine, Oregon 97739
TEL (541) 536-1432 — FAX (541) 536-1462
www.lapineoregon.gov

Memorandum: SDC Calculation for remaining (11) Townhomes

From: Public Works Director Jake Obrist

To: City Council

Water: $3,871 x (11) units= **$42,581**

Sewer: $6,663 x (11) units= **$73,293**

Streets: $4,409 x(11) units=**$48,499**

Future projects to consider that are SDC eligible:

- *Water/Wastewater Expansion and Improvement Project*
- *Wastewater Lift Station Upgrades (Newberry, Industrial, and 1st St)*
- *Capital Improvement Plan for street projects (Cagle Rd, Huntington Downtown, etc..)*
- *Pedestrian Pathway Projects*
- *Streetscape Projects*

anderson perry & associates, inc.

1901 N. Fir Street, P.O. Box 1107
La Grande, OR 97850
(541) 963-8309, Fax (541) 963-5456
www.andersonperry.com

engineering • surveying • natural resources

February 8, 2021

Mayor Daniel Richer and City Council
City of La Pine
P.O. Box 2460
La Pine, Oregon 97739

Dear Mayor Richer and City Council:

Anderson Perry & Associates, Inc. (AP) has a policy to give back to the communities where we work. In addition to contributing to various charities and other organizations, we have developed a scholarship program we feel channels our donation efforts in a very worthwhile direction. Since this program's inception, AP has proudly awarded thousands of dollars in scholarships for graduating seniors each year.

We are pleased to announce that our Board of Directors has selected the City of La Pine as an area where we plan to sponsor a scholarship for a deserving high school senior this spring. The scholarship will be in the amount of $1,000 and will be given on behalf of the City of La Pine and our firm.

AP has an interest in developing awareness and the engineering industry within the community. Preferably, we would like to offer this scholarship to a graduating senior interested in pursuing a degree in a Science, Technology, Engineering, and Math (STEM)-related field. We would like to suggest handling the scholarship in one of two ways.

1. AP has developed a scholarship application process that allows students to apply online and includes coordination with the school representative. Under this option, AP would collect and review the applications, and help select a candidate. After that, we would anticipate the City of La Pine awarding the scholarship at a time and location of their choice.
2. The City of La Pine handles the scholarship process internally as they see fit, including coordination with the school.

Please contact Deb Cornford at (541) 963-8309 or dcornford@andersonperry.com and let her know which option you would prefer no later than Thursday, February 25, 2021. For either option, AP will provide a certificate to the City of La Pine to be presented to the recipient. In the fall, we will send a check directly to the recipient's college of choice.

Sincerely,

ANDERSON PERRY & ASSOCIATES, INC.

By Brad D. Baird
Brad D. Baird, P.E., President

BDB/dc
cc: 2021 Scholarship File

CITY OF LA PINE

BID DOCUMENTS

FOR

LA PINE STATION

PLANS PREPARED FOR:
THE CITY OF LA PINE

PLANS PREPARED BY:
THE CITY OF LA PINE
P.O. Box 2460
16345 Sixth St
La Pine, OR 97739

And

BECON CIVIL ENGINEERING & LAND SURVEYING
549 SW Mill View Way, Suite 100
Bend, Oregon 97702

February 2021

The required submittal listing for the **"La Pine Station Project"** is as follows:

#	ITEM	# OF PAGES	√
1	BID SCHEDULE	4	
2	CONTRACTOR EXPERIENCE FORM	2	
3	BID BOND	2	
4	FIRST TIER SUBCONTRACTOR DISCLOSURE FORM	1	
5	PROPOSAL	3	
6	NON-COLLUSION AFFIDAVIT	2	
7	PREVAILING WAGE COMPLIANCE STATEMENT	1	
8	DRUG TESTING POLICY STATEMENT	1	

TOTAL BID PROPOSAL WILL CONTAIN A MINIMUM OF: 16 PAGES

INVITATION TO BID

Sealed bids for the construction of the City of La Pine, **La Pine Station Project**, addressed to Public Works and Planning Admin, Kelly Notary, City of La Pine, Oregon will be received until 2:00 PM local time at City Hall, 16345 Sixth St, P.O. Box 2460, La Pine, Oregon, on **March 25, 2021** and then publicly opened and read at 2:00 PM at City Hall, in La Pine, Oregon. Bids shall be clearly labeled: **La Pine Station Project.**

Scope of Work:

The project will develop a transit hub to be located at 51487 Hwy 97 in La Pine, Oregon. The project includes a public restroom (with storage and maintenance area), parking area, pedestrian sidewalks, picnic area, landscaping, signage, lighting, and additional associated and incidental construction items.
The City estimates the cost of improvements at $850,000.

Construction plans titled, **La Pine Station Project** dated **December 2020**, consisting of **13** sheets and project specifications are herein incorporated into the Request for Bid for detail of the overall scope of the project including the scope of services for this portion of the project. **All workmanship, materials, and conditions shall conform to the 2018 Oregon Standard Specifications for Construction and the City of La Pine, Oregon 2016 Standards and Specifications.**

This is a Public Works Contract and subject to Oregon Bureau of Labor and Industries (BOLI) Prevailing Wage Rates (only if project costs exceed $50,000) Effective January 1, 2021 for Region 10.

Completion:

It is the intent of the City of La Pine to achieve substantial completion by August 31, 2021.

Project Timeline:

Advertisement	February 26, 2021
Bid Opening	March 25, 2021
Bid Review	March 26, 2021
Intent to Award	March 26, 2021
Council Contract Award	April 14, 2021
Anticipated Work Period	April 16 to August 31, 2021
Substantial Completion by	August 31, 2021

Liquidated Damages

Liquidated damages will be assessed at $500 per work day should the Contractor fail to complete the work within the time allowed.

Contract Documents

Contract Documents may be examined at the following locations:

- City of La Pine, City Hall
- Premier Builders Exchange
- BECON Civil Engineering

Addendums issued during the advertisement phase of the project will be posted on the City of La Pine website and the Premier Builder's Exchange website. Bidders shall submit their proposal on the proposal forms contained within the contract documents or on alternate forms as prescribed by the bid documents. The City of La Pine will not accept any bid that is not submitted as prescribed in the Bid Documents package.

All requests for plans and bid documents shall be made to Kelly Notary, Public Works and Planning Admin at City of La Pine, call 541.536.1432.

Requirements of Bidders

Each proposal must be submitted on the prescribed forms and accompanied by a certified check or Bid Bond executed on the prescribed form, payable to the City of La Pine, Oregon, in an amount not less than 10% (10 percent) of the amount bid. The successful Bidder will be required to furnish the necessary additional bond(s) for the faithful performance of the Contract, as prescribed in the Contract Documents.

The attention of bidders is directed to the State government requirements and conditions of employment to be observed and minimum wage rates to be paid under the Contract.

The City of La Pine will closely review the Contractor's Experience form to ensure a Contractor with acceptable experience is awarded the Contract for the **La Pine Station Project.**

All Contractors submitting a bid must be registered with the Construction Contractors Board or the bid will not be received or considered. A bid from an unregistered contractor will be rejected as unresponsive.

Pre-Bid Meeting

There will be no pre-bid meeting for the La Pine Station Project. Direct all requests for clarification to City Engineer Erik Huffman, BECON Civil Engineering and Land Surveying, (541) 633-3140 or ehuffman@beconeng.com.

Verbal communications are not binding on the contract. All requests for clarification shall be made in writing and a Clarification Addenda will be issued prior to bid opening.

Proposals

The City reserves the right to reject all proposals or any proposal not conforming to the requirements of the Contract Documents, and postpone the awarding of the contract for a period of not more than 30 days from the bid opening date.

Notification

The notification of Intent to Award will be made to all responsible bidders within seven (7) calendar days of the bid opening. Protest of bid results and Intent to Award must be in writing, must be by a bidder in good legal standing, must be specific, and must be received within seven (7) calendar days of the date of issuance of the Intent to Award. The protest envelope must give bid title reference and must be addressed to Kelly Notary, City of La Pine, 16345 Sixth Street, P.O. Box 2460, La Pine, Oregon 97739.

INSTRUCTION TO BIDDERS

PROJECT TITLE: **La Pine Station Project**

LOCATION: 51487 Hwy 97, La Pine, Oregon. The North side of 4th Street between Huntington Road and Highway 97.

OWNER: City of La Pine

PROPOSAL: To be entitled to consideration, please include:

Bid Schedule

1. Use bid schedule(s) provided. Fill in all blank spaces.

2. Bid shall be typed or prepared in blue ink, and signed in blue ink.

3. Complete without alterations or erasures.

4. Shall not contain any recapitulation of work to be done.

5. No oral, telephonic or telegraphic proposal or modifications will be considered.

6. Contractor must certify that it is or is not an Oregon business as per ORS 279A.120. ORS 279A.120 requires public contracting agencies, in determining the lowest responsible bidder, to add a percent increase to each out-of-state bidder's bid price which is equal to the percent of preference given to local bidders in the bidder's home state. The bidder shall certify that it is or is not an Oregon contractor as defined under ORS 279A.120, Preferences; Foreign Contractor, i.e., a foreign contractor is one who is not domiciled in or registered to do business in the State of Oregon.

7. All subcontractors are to be approved in writing by the Owner and carry the same insurance requirements as the prime contractor. Subcontractors shall submit Contractor's Board license number, Federal Identification Number, State Unemployment Number, and Certification of ORS 279A.120 as stated in the First Tier Subcontractor Disclosure Form.

Contractor’s Experience Form

The Contractor’s Experience form shall be completed and returned with the bid submittal.

Bid Bond

Enclose a bidder's bond, certified check (or cashier's) check with made payable to the Owner in an amount equal to 10% of the total bid.

First Tier Subcontractor Disclosure Form
The First Tier Subcontractor Disclosure Form shall be completed and returned within 2 hours of the bid submittal time. The first tier subcontractor list may also be submitted with the sealed bid at contractor's preference. The submittal of the First Tier Subcontractor Disclosure Form is mandatory for the La Pine Station Project.

Proposal
Enclose a completed Proposal form provided in the Bid Documents.

Prevailing Wage Rate Statement
The Prevailing Wage Rate Statement shall be completed and returned with the Bid Submittal per ORS 279C.800 – 279C.870.

Drug Testing Policy Statement
The Drug Testing Policy Statement shall be completed and returned with the Bid Submittal per ORS 279C.505 (2003 Chapter 794.138).

Non-Collusion Affidavit
The Non-Collusion Affidavit shall be completed and returned with the Bid Submittal.

Bid Submittal

Address and Deliver:

1. Address: City of La Pine
   16345 Sixth Street
   P.O. Box 2460
   La Pine, OR 97739

2. Deliver: To Public Works and Planning, in an opaque sealed envelope marked **La Pine Station Project**, with the name of the bidder, on or before **March 25, 2021 (2:00 pm).**

AWARD OF CONTRACT:

Contract award will in general be made to lowest responsible bidder. The award will be based on the lowest cumulative total of the base bid amount and all bid alternates in the bid schedule. The City may elect to award any or all bid alternates whichever it determines to be in the best interest of the City. Supplemental unit price items are not part of the determination of cost for award, however, supplemental unit prices will be reviewed for consistency with base bid and bid alternate costs and the City will consider supplemental unit prices in the determination of responsible bidders. The City reserves the right to award only a portion of the project if it is in the best interest of the City.

The competency and responsibility of bidders and of their proposed subcontractors will be considered in making the award. Owner reserves the right to reject bid of any bidder who

has previously failed to perform properly and to complete on time contracts of a similar nature, who is not in a position to perform the Contract, who has habitually and without cause neglected the payment of bills or otherwise disregarded their obligation to subcontractors, material men or employees.

Bidder should notify Owner prior to bid opening date, should omissions or errors be found in Contract Documents. Owner will clarify by sending written instructions to all bidders in the form of Addenda which will become a part of the Contract.

Owner will not be responsible for any oral instructions or interpretations.

EXAMINATIONS:

Bidder is responsible for verifying dimensions and bid quantities prior to bidding.

Before submitting a proposal, the bidder shall carefully examine all Contract Documents, visit the site of the work, and fully inform themselves of all existing conditions and limitations. Bidders shall include in the bid, sum or sums sufficient to cover the cost of all items in this Contract.

Bidder should notify Owner prior to bid opening date, should omissions or errors be found in Contract Documents. Owner will clarify by issuing instructions in the form of Addenda which will become a part of the Contract.

Owner will not be responsible for any oral instructions or interpretations.

Bidder is responsible to review all documents he/she will submit in the Proposal as complete. <u>All</u> pages listed on the Bidder's Required Submittal Listing are required to be included in the Proposal.

ANY ADDENDA:
Any addenda issued during the time of bidding are to be covered in the Proposal, and in closing a Contract they will become part thereof. Signed copy of the addenda is to be included with the bid submittal. All addenda will be made in PDF format, available on the City of La Pine and Premier Builders Exchange websites. The City of La Pine will not mail or fax notice of Addenda, but will publish notice of any addenda on the City of La Pine and Premier Builders Exchange. Bidders should frequently check the website at least once weekly until the week of bid opening. Any addenda issued during the time of bidding are to be covered in the Proposal, and in closing a Contract they will become part thereof.

SUBSTITUTIONS:
In order to obtain approval of material, products, methods, as equal to those specified, submit to Owner substitution request at least five (5) days before bid opening.

CONTRACT DOCUMENTS:
The contractor and subcontractors shall comply with all Conditions of the Contract Documents.

PAYMENT ON CONTRACT:

Payment will be made as provided in the Contract. The contractor and subcontractors must pay not less than the minimum hourly rate of wage as determined by the Commissioner of Bureau of Labor for the City of La Pine, and which is not less than prevailing wage. They or their sureties must execute a statement under oath in a form prescribed by the State Labor Commissioner, certifying the hourly rate of wage paid and that no workman was paid less than prevailing rate of wage or less than the minimum hourly rate of wage and file with the Clerk of the District prior to any disbursement under the Contract and in accordance with ORS 279C.800 thru 279C.870. Contractors shall make payments in accordance with the Contract, ORS 279C.840 to 279C.870 and the laws of the State of Oregon. Contractor is required to have a $30,000 Public Works Bond filed with CCB before starting work on the project, unless exempt. (SB 477, Sections 2-5) Contractor is required to verify their subcontractors have filed bond.

PECUNIARY INTEREST:

No director or employee of Owner shall have any pecuniary interest in the project.

LOCAL LABOR:

Contractor and subcontractors are encouraged to use local labor when available.

QUALIFICATIONS AS A CONDITION PRECEDENT TO BIDDING:

All Contractors submitting a bid must be registered with the Construction Contractors Board, or the bid will not be received or considered. A bid from an unregistered contractor will be rejected as unresponsive.

COMPLETION:

The Project shall be substantially completed by August 31, 2021.

Project Contact

All design questions and clarification inquiries shall be made to City Engineer Erik Huffman, BECON Civil Engineering & Land Surveying, 541.633.3140.

All questions will be responded to in a written Addendum issued 3 days prior to bid opening. It will be available on the City of La Pine website and at the Premier Builders Exchange. All questions received after this date will not receive response.

Bidder Name _____

Base Bid Schedule

LA PINE STATION

Item #	Description of Item	QTY	Unit	Unit Price Bid	Total Price Bid
1	Mobilization	1	Lump Sum		
2	Work Zone Traffic Control	1	Lump Sum		
3	Construction Staking	1	Lump Sum		
4	Temporary Construction Fencing (Work Area only)	1	Lump Sum		
5	Erosion and Sediment Control	1	Lump Sum		
6	Clearing and Grubbing	1	Lump Sum		
7	Removal of Concrete Walks	55	Square Yard		
8	Removal of Curbs	77	Linear Foot		
9	Removal of Asphalt	36	Square Yard		
10	Excavation and Earthwork	1345	Cubic Yard		
11	Public Street Curb	77	Linear Foot		
12	Concrete Walks, 4-inch	360	Square Foot		
13	Concrete Driveway, 6-inch	825	Square Foot		
14	Water Service, 2-inch	1	Each		
15	Standard Concrete Curb	795	Linear Foot		
16	Rolled Curb, 4” reveal	115	Linear Foot		
17	HMAC, 3-inch	1677	Square Yard		

18	¾” Base Rock, 8-inch	1677	Square Yard		
19	Trash Enclosure	1	Each		
20	Area Drain Catch Basin	4	Each		
21	Drain Pipe, 8-inch	215	Linear Foot		
22	Water Service Lines, 2-inch	111	Linear Foot		
23	Sewer Service Lateral, 4-inch	1	Each		
24	Septic Tank	1	Each		
25	Ornamental Lighting Poles, Luminaire, Lamps, and Ballasts	4	Each		
26	Concrete Street Light Pole Foundation	4	Each		
27	Electrical Conduit, 1-inch	860	Linear Foot		
28	Electrical Junction Box	4	Each		
29	10# XHHW Copper Wire (3)	2580	Linear Foot		
30	2 Unit Restroom building (include installation)	1	Each		
31	6” Sewer Lateral (sewer service only)	90	Linear Foot		
32	2” Backflow Device	1	Each		
33	Joint Trench with 2” PVC Water Service Line	130	Linear Foot		
34	Joint Trench without 2” Water Service	80	Linear Foot		
35	Site Electrical for Restroom and Electric Vehicle Charging Station	1	Each		
36	Concrete Flatwork, 4-inch	6775	Square Foot		
37	Concrete Flatwork, 6-inch	572	Square Foot		

38	ODOT Street Lights	3	Each		
39	Picnic Shelter/Shade Structure	1	Each		
40	Site Wall/Seat Wall/Art Wall including Flagpole Sleeves	1	Each		
41	Bicycle Racks	3	Each		
42	Bicycle Fix It Station	1	Each		
43	Trash Receptacle	3	Each		
44	Pavement Markings	2110	Linear Feet		
45	Street Signs	3	Each		
46	Gravel Surfacing on Phase 2 Area (2" depth uncompacted)	1235	Square Yards		
47	Trees Evergreen – 4' – 5' Ht	4	Each		
48	Turf Areas – Seed	1070	Square Feet		
49	Ornamental Shrub Beds – Medium Density Planting	1070	Square Feet		
50	Topsoil at Turf Areas (6" Depth)	119	Cubic Yard		
51	Topsoil at Shrub Beds (6" Depth)	1650	Cubic Yard		
52	Irrigation System (Turf and Shrub Areas)	15,970	Linear Feet		
53	Cedar Wood Fence	306	Linear Feet		

Total Amount of Base Bid **$_____**

Total Base Bid price written out in words: _____

_____

All Unit Price Bids should be considered as “Furnished and Installed” unless otherwise noted in these Request for Bid.

Please invoice referencing the above exact line item numbers and line items. All quantities must be approved by the Project Engineer before invoicing. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items shall be based on actual quantities, determined as provided in the Contract documents*.*

To Be Considered Responsive, the following must be signed and completed by your firm:

We hereby certify to do the work as specified and at the price as quoted in conformance to all the City, State and Federal Regulations that are applicable and will indemnify the City of La Pine against all claims arising out of any actions caused by our company during the performance of this contract.

Bidders Official Company Name _____

Address _____

By _____ Date _____
(Signature of Authorized Official and Title)

By _____ Phone _____
(Type or Print Name)

Federal I.D.#_____ FAX # _____Email:_____

CONTRACTOR'S EXPERIENCE

Please list at least five similar projects to the La Pine Station Project that have been completed in the last five years.

#1

PROJECT OWNER: _____

DESCRIPTION OF PROJECT: _____

PROJECT ENGINEER: _____

TOTAL COST OF PROJECT: _____

CONTACT NAME: _____

CONTACT NAME TELEPHONE #: _____

#2

PROJECT OWNER: _____

DESCRIPTION OF PROJECT: _____

PROJECT ENGINEER: _____

TOTAL COST OF PROJECT: _____

CONTACT NAME: _____

CONTACT NAME TELEPHONE #: _____

#3

PROJECT OWNER: _____

DESCRIPTION OF PROJECT: _____

PROJECT ENGINEER: _____

TOTAL COST OF PROJECT: _____

CONTACT NAME: _____

CONTACT NAME TELEPHONE #: _____

_____

#4 _____

PROJECT OWNER: _____

DESCRIPTION OF PROJECT: _____

PROJECT ENGINEER: _____

TOTAL COST OF PROJECT: _____

CONTACT NAME: _____

CONTACT NAME TELEPHONE #: _____

_____

#5 _____

PROJECT OWNER: _____

DESCRIPTION OF PROJECT: _____

PROJECT ENGINEER: _____

TOTAL COST OF PROJECT: _____

CONTACT NAME: _____

CONTACT NAME TELEPHONE #: _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, That _____

hereinafter called the PRINCIPAL, and _____

a corporation duly organized under the laws of the State of _____, having its principal place of business at _____, in the State of _____, and authorized to do business in the State of Oregon, as SURETY, are held and firmly bound unto the City of La Pine, Oregon, as obligee, hereinafter called the CITY, in the penal sum of _____ dollars ($ _____) for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS BOND ARE SUCH That, whereas the PRINCIPAL herein is herewith submitting his or its bid proposal for the **La Pine Station Project,** said bid proposal, by reference thereto, being hereby made a part hereof.

NOW, THEREFORE, if the said bid proposal submitted by the said PRINCIPAL be accepted, and the contract be awarded to said PRINCIPAL, and if the said PRINCIPAL shall execute the proposed Agreement and shall furnish such performance and payment bonds as required by the bidding and Contract Documents within the time fixed by said documents, then this obligation shall be void; if the PRINCIPAL shall fail to execute the proposed Agreement and furnish said bond, the SURETY hereby agrees to pay to the

CITY the penal sum as liquidated damages.

Signed and sealed this _____ day of _____, 2021.

_____

By

_____

Principal

_____

Surety

_____

By Attorney-in-fact

(A certified copy of the agent's power-of-attorney must be attached hereto.)

FIRST TIER SUBCONTRACTOR DISCLOSURE FORM

PROJECT NAME: La Pine Station Project

BID SUBMITTAL: _____ _____
DATE: ***TIME:***

DISCLOSURE DEADLINE: _____ _____
DATE: ***TIME:***

List below the Name, Address, Contact Name and Telephone Number of each subcontractor that will be furnishing labor or labor and materials that are required to be disclosed. Enter "NONE" if there are no subcontractors that need to be disclosed. (Attach additional sheets if needed).

Name/Address	*Nature of Work Performed*	*Contact Phone #*	*Contract Amount*
1.			
2.			
3.			
4.			
5.			

The above listed First-Tier Subcontractor(s) are providing labor or labor and materials with a dollar value equal to or greater than:

5% of the total Contract Price, but at least $15,000 (including all alternates). If the dollar value is less than $15,000 do not list the subcontractor above; or,
$350,000 regardless of the percentage of the total Contract Price.

FORM SUBMITTED BY (BIDDER NAME): _____

CONTACT NAME _____ ***PHONE #:*** _____

DELIVER FORM TO AGENCY: ***City of La Pine***

PERSON DESIGNATED TO RECEIVE FORM: Kelly Notary, Public Works and Planning Admin
PHONE #: 541.536.1432

AGENCY ADDRESS ***16345 Sixth Street, P.O. Box 2460, La Pine, OR 97739***

UNLESS OTHERWISE STATED IN THE ORIGINAL SOLICITATION, THIS DOCUMENT SHALL NOT BE FAXED. IT IS THE RESPONSIBILITY OF THE BIDDERS TO SUBMIT THIS DISCLOSURE FORM AND ANY ADDITIONAL SHEETS, WITH THE PROJECT NAME CLEARLY MARKED, AT THE LOCATION INDICATED BY THE SPECIFIED DISCLOSURE DEADLINE. SEE INSTRUCTIONS TO BIDDERS.

Rev: 03-09-2000 Agency will insert "N/A" above if the Contract amount value is anticipated to be less than $100,000. Otherwise this form must be submitted within two working hours of the advertised bid closing date and time; no later than the DISCLOSURE DEADLINE stated above. Bids which are submitted by Bid Closing, but for which the separate disclosure submittal has not been made by the specified deadline, are Not Responsive and shall not be considered for Contract award.

PROPOSAL
La Pine Station Project

BIDDER'S DECLARATION:

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this proposal are those named herein, that this proposal is, in all respects, fair and without fraud, that it is made without collusion with any official of the City, and that the proposal is made without any connection or collusion with any person making another proposal on this Agreement.

The Bidder further declares that he has carefully examined the Contract Documents for the construction of the project, that he has personally inspected the site, that he has satisfied himself as to the quantities involved, and that this proposal is made according to the provisions and under the terms of the Contract Documents, which documents are hereby made a part of this proposal.

The Bidder further declares that the provisions required by ORS 279C.800 to 279C.870 relating to prevailing wage rates shall be complied with.

The Bidder further agrees that he has exercised his own judgment regarding subsurface condition and has utilized all data which he believes pertinent from the City and other sources in arriving at his conclusions.

CONTRACT EXECUTION:

The Bidder agrees that if this proposal is accepted, he will, within ten (10) days, not including Sundays and legal holidays, after notice of award, sign the Agreement in the form annexed hereto, and will to the extent of his proposal, furnish all machinery, tools, apparatus, and other means of construction and do the work and furnish all the materials necessary to complete the work in the manner, in the time, and according to the methods specified in the Contract Documents and required by the City thereunder.

In the event that the Bidder shall fail to enter into a contract within such time, the bid security in the amount stated in the INVITATION TO BID and deposited herewith, shall be retained by the City and it is agreed that said sum is a fair measure of the amount of damage that the City will sustain because of such failure to enter into a contract.

CERTIFICATES OF INSURANCE:

The bidder further agrees to furnish the City, before commencing the work under the Contract, the certificates of insurance as specified in these documents.

CONSTRUCTION TIME LIMITS:

The Bidder agrees to begin work within ten (10) calendar days after the date of the City's

written notice to proceed, and to complete all work to be done under the contract in the time frames noted in the INVITATION TO BID after the date of the City's written notice to proceed.

LIQUIDATED DAMAGES:

In the event the Bidder is awarded the Agreement and shall fail to complete the work within the time limit or extended time limit agreed upon, as more particularly set forth in the Request for Bid, liquidated damages shall be paid to the City per the Request for Bid.

SUBCONTRACTORS:

The Bidder will list all proposed subcontractors by their proper corporate name and the portion of the work the subcontractor intends to perform in the spaces provided below. Contractor is also required to comply with the regulations regarding First Tier Subcontractors and applicable submittals.

	Subcontractor	Work item to be performed
1.		
2.		
3.		
4.		
5.		

The City reserves the right to reject any subcontractor that the City deems unfit for the scope of the work proposed.

LUMP SUM OR UNIT PRICES:

The Bidder further proposes to accept as full payment for the work proposed herein the amounts computed under the provisions of the Contract Documents and based on the following lump sum or unit price amounts. The Bidder agrees that the lump sum prices and the unit prices represent a true measure of the labor and materials required to perform the work, including all allowances for overhead and profit for each type and unit of work called for in these Contract Documents.

The City reserves the right to reject any and all bids, to waive any informalities and to accept the bid of the lowest responsible Bidder.

ADDENDA:

The Bidder acknowledges that addenda numbers _____
(Bidder insert number of each addendum received)
have been received and examined as part of these Contract Documents.

RESIDENT BIDDER STATUS:

Bidder Certifies that it is a:
_____ Resident Bidder as defined in ORS 279A.120

_____ Not a resident bidder as defined in ORS 279A.120
Resident of State _____.

BIDDER:

The name of the bidder submitting this proposal:

_____

Name: Address:

The above stated address is the address to which all communications concerned with this proposal and with the contract are to be sent. The names of the principal officers of the corporation, or partnership, or of all persons interested in this proposal as principals are as follows:

_____ _____

If sole proprietor or partnership:
In witness hereto the undersigned has set his (its) hand this
_____ day of _____, 2021.

_____
Signature of Bidder

_____
Title

If corporation:
In witness whereof the undersigned corporation has caused this instrument to be executed by its duly authorized officers this

____ day of _____, 2021_____
Name of Corporation

By _____
President

NON-COLLUSION AFFIDAVIT

CONTRACT:

STATE OF OREGON)
) SS.
COUNTY OF _____)

I state that I am the _____ of _____ 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 further 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) That neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid have been discussed with any other firm or person which 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, or to submit a bid higher than this bid, or submit a bid intentionally high or non-competitive or any other form of complementary bid.

(4) The bid of my firm is made in good faith and pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other non-competitive bid.

(5) _____ , its affiliates, and subsidiaries, officers,
(NAME OF FIRM)
directors and employees are not currently under investigation by any government agency and have not in the last four years been convicted of or found liable for any act prohibited by State and Federal law in the jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described on the attached appendix.

I further state that _____ understands and acknowledges that the
(NAME OF FIRM)
above representations are material and important, and will be relied on for the City of La Pine, Oregon in awarding the contract from 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 La Pine, Oregon of the true facts relating to the submission of bids for the contract.

Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

Sworn to and subscribed before me this _____ day of _____, 2021.

(SEAL) _____
NOTARY PUBLIC OF OREGON
My commission expires:_____

PREVAILING WAGE RATE COMPLIANCE STATEMENT

The bidder states that provisions of ORS 279C.800 – 279C.870 (Oregon Prevailing Wage Rates) will be complied with on the **La Pine Station Project** (if project costs exceed $50,000).

COMPANY NAME _____

SIGNATURE _____

TITLE _____

DATE _____

● Applicable prevailing wage rates are those in effect at the time the initial specifications are first advertised for bid solicitation. ORS 279C.830(1)(c); OAR 839-025-0020(4) and (5) The workers must be paid not less than the applicable state prevailing wage rate. ORS 279C.830; OAR 839-020-0115(3)

● The contractor and every subcontractor must have a public works bond filed with the Construction Contractors Board before starting work on the project. ORS 279C.830(2)(a) Every subcontractor is required to have a public works bond filed with the Construction Contractors Board before starting work on the project. ORS 279C.830(2)(b)

● If the contractor fails to pay for labor and services, the City can pay for them and withhold these amounts from payments to the contractor. ORS 279C.515; OAR 839.025.0020(2)(a)

● The contractor must pay daily, weekly, weekend and holiday overtime as required. ORS 279C.520; OAR 839-025-020(2)(c)

● The contractor must make prompt payment for all medical services for which the contractor has agreed to pay, and for all amounts for which the contractor collects or deducts from the worker's wages. ORS 279C.530; OAR 839-025-0020(2)(d)

● The employer must give written notice to the workers of the number of hours per day and days per week they may be required to work. OAR 839-025-0020(2)(c)
BOLI Contact:

Bureau of Labor and Industries
Wage and Hour Division
Prevailing Wage Unit
800 N.E. Oregon Street, #32
Portland, OR 97232
www.oregon.gov/BOLI

DRUG TESTING POLICY STATEMENT

The bidder states that provisions of ORS 279C.505 [Chapter 794.138] requiring an employee drug-testing program will be complied with the **La Pine Station Project.**

COMPANY NAME:

SIGNATURE:

TITLE:

DATE:

PERFORMANCE BOND

(NOTE: CONTRACTOR MUST USE THIS FORM, NOT A SURETY COMPANY FORM. MUST BE ACCOMPANIED BY A POWER OF ATTORNEY FOR THE SURETY'S OFFICER AUTHORIZED TO SIGN)

We the undersigned _____ as PRINCIPAL (hereinafter called CONTRACTOR), and _____ _____ a corporation organized and existing under and by virtue of the laws of the state of _____ duly authorized to do surety business in the state of Oregon and named on the current list of approved surety companies acceptable on federal bonds and conforming with the underwriting limitations as published in the Authorized Insurance List in the State of Oregon published by the Office of the Insurance Commissioner and which carries an "A" rating and is of the appropriate class for the bond amount as determined by Best's Rating System, as SURETY, hereby hold and firmly bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, to pay to CITY OF LA PINE as OBLIGEE (hereinafter called CITY OF LA PINE), the amount of_____ _____ (equal to 100% of the total bid amount) in lawful money of the United States of America.

WHEREAS, the CONTRACTOR entered into a contract with CITY OF LA PINE dated _____ which Contract is hereunto annexed and made a part hereof, for accomplishment of the all contract terms for the project described as follows: **La Pine Station Project**

NOW, THEREFORE, the condition of this obligation is such that if the CONTRACTOR shall promptly, truly and faithfully perform all the undertakings, covenants, terms, conditions, and agreements of the aforesaid contract and having performed its obligations thereunder, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever CONTRACTOR shall be declared by CITY OF LA PINE to be in default under the Contract Documents for the project described herein, the SURETY may promptly remedy the default by completing the project in accordance with the Contract Documents and the project Specifications with a contractor approved by the CITY OF LA PINE. SURETY, for value received, further stipulates and agrees that all changes, extensions of time, alterations, or additions to the terms of the Contract or Specifications for the above described contract are within the scope of the SURETY's undertaking on

this bond, and SURETY hereby waives notice of any such change, extension of time, alteration or addition to the terms of the contract or to the Work or to the Specifications. Any such change, extension of time, alteration or addition to the terms of the contract or to the Work or to the Specifications shall automatically increase the obligation of the Surety hereunder in a like amount, provided that such increase shall not exceed twenty-five percent (25%) of the original amount of the obligation without the consent of the Surety.

This obligation shall continue to bind the PRINCIPAL and SURETY, notwithstanding successive payments made hereunder, until the full amount of the obligation is exhausted.

SURETY shall indemnify, defend, and protect the CITY OF LA PINE against any claim of direct or indirect loss resulting from the failure of the CONTRACTOR (or any of the employees, subcontractors, or lower tier subcontractors of the CONTRACTOR) to faithfully perform the terms of the contract.

No right of action shall accrue on this bond to or for the use of any person or corporation other than CITY OF LA PINE or its heirs, executors, administrators, successors or assigns.

If more than one SURETY is on this bond, each SURETY hereby agrees that it is jointly and severally liable for obligations on this bond.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 2021.

_____	_____
SURETY	CONTRACTOR
By:_____	By*:_____
Title:_____	Title:_____
_____	_____
Street Address	Street Address
_____	_____
City State ZIP	City State ZIP
_____	_____
Phone Number	Phone Number

* Must be signed by president or vice-president of Contractor.

PAYMENT BOND

(NOTE: CONTRACTOR MUST USE THIS FORM, NOT A SURETY COMPANY FORM. MUST BE ACCOMPAINED BY A POWER OF ATTORNEY FOR THE SURETY'S OFFICER AUTHORIZED TO SIGN)

KNOW BY ALL MEN BY THESE PRESENTS:

We the undersigned _____ as PRINCIPAL (hereinafter called CONTRACTOR), and _____ _____ a corporation organized and existing under and by virtue of the laws of the state of _____ duly authorized to do surety business in the state of Oregon and named on the current list of approved surety companies acceptable on federal bonds and conforming with the underwriting limitations as published in the Authorized Insurance List in the State of Oregon published by the Office of the Insurance Commissioner and which carries an "A" rating and is of the appropriate class for the bond amount as determined by Best's Rating System, as SURETY, hereby hold and firmly bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, to pay to CITY OF LA PINE as OBLIGEE (hereinafter called CITY OF LA PINE), the amount of _____ in lawful money of the United States of America.

WHEREAS, the CONTRACTOR entered into a contract with CITY OF LA PINE dated _____, which Contract is hereunto annexed and made a part hereof, for accomplishment of the all contract terms for the project described as follows: **La Pine Station Project**

NOW, THEREFORE, the condition of this obligation is such that if the CONTRACTOR shall promptly, truly and faithfully perform all the undertakings, covenants, terms, conditions, and agreements of the aforesaid contract and having performed its obligations thereunder and promptly make payments to all persons, firms, subcontractors, corporations and/or others furnishing materials for or performing labor in the prosecution of the Work provided for in the aforesaid contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever CONTRACTOR shall be declared by CITY OF LA PINE to be in default under the Contract Documents for the project described herein, the SURETY shall promptly remedy the default by completing the project in accordance with the Contract Documents and the project Specifications with a contractor approved by the CITY OF LA

PINE. SURETY, for value received, further stipulates and agrees that all changes, extensions of time, alterations, or additions to the terms of the Contract or Specifications for the above described contract are within the scope of the SURETY's undertaking on this bond, and SURETY hereby waives notice of any such change, extension of time, alteration or addition to the terms of the contract or to the Work or to the Specifications. Any such change, extension of time, alteration or addition to the terms of the contract or to the Work or to the Specifications shall automatically increase the obligation of the Surety hereunder in a like amount, provided that such increase shall not exceed twenty-five percent (25%) of the original amount of the obligation without the consent of the Surety.

This obligation shall continue to bind the PRINCIPAL and SURETY, notwithstanding successive payments made hereunder, until the full amount of the obligation is exhausted.

SURETY shall indemnify, defend, and protect the CITY OF LA PINE against any claim of direct or indirect loss resulting from the failure of the CONTRACTOR (or any of the employees, subcontractors, or lower tier subcontractors of the CONTRACTOR) to faithfully perform the terms of the contract.

No right of action shall accrue on this bond to or for the use of any person or corporation other than CITY OF LA PINE or its heirs, executors, administrators, successors or assigns.

If more than one SURETY is on this bond, each SURETY hereby agrees that it is jointly and severally liable for obligations on this bond.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 2021.

_____	_____
SURETY	CONTRACTOR
By:_____	By*:_____
Title:_____	Title:_____
_____	_____
Street Address	Street Address
_____	_____
City State ZIP	City State ZIP
_____	_____
Phone Number	Phone Number

* Must be signed by president or vice-president of Contractor

AFFIDAVIT #1

TO: CITY OF LA PINE, OREGON

RE: **La Pine Station Project**

GENTLEMEN:

COMES NOW _____,

doing business as _____,

who being first duly sworn, deposes and says:

That all sums due to suppliers, materialmen, subcontractors, sub-subcontractors, employees and government agencies for wages, goods, services, products, or equipment furnished in connection with the above project have been paid in full. Except as hereinafter stated, this includes, but not limited to all State and Federal withholding taxes, worker's compensation insurance, Oregon unemployment insurance, FUTA unemployment insurance, and social security taxes.

The only obligations which have not been paid and which are known to us are as follows:

1. _____ $ _____

2. _____ $ _____

3. _____ $ _____

4. _____ $ _____

5. _____ $ _____

If extra space is needed, please attach an extra sheet, date and sign.

WE HEREBY authorize you to pay from the remaining funds, the foregoing obligations by making a check payable to us and to the unpaid creditor/s jointly.

DATED this _____ day of _____, 2021.

By: _____

Title:_____

STATE OF OREGON)
)ss.
County of _____)

The foregoing instrument was acknowledged before me this _____ day of _____, 2021, by _____, the authorized representative for said business, and that (s)he was authorized to sign this affidavit.

_____
NOTARY PUBLIC FOR OREGON

My Commission Expires:_____

AGREEMENT

THIS AGREEMENT, made this _____day of _____, 20_____, by and between _____, hereinafter called "OWNER"
(Name or Owner)
and _____ doing business as (an individual,) or (a partnership, or (a corporation) hereinafter called “CONTRACTOR”.

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR will commence and complete the construction of the **La Pine Station Project.**

2. The CONTRACTOR will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT described herein.

3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within _____ calendar days after the date of the NOTICE TO PROCEED and will complete the same within _____ calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

4. The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of $_____, or as shown in the Bid schedule.

5. The term “CONTRACT DOCUMENTS” means and includes the following:

A Invitation to Bid

B Bid Schedule

C Contractor’s Experience Form

D Bid Bond
E First Tier Contractor Disclosure Form
F Proposal
G Non-Collusion Affidavit
H Prevailing Wage Rate Compliance Statement
I Drug Testing Policy Statement
J Performance Bond
K Payment bond
L Affidavit #1
M Agreement
N State of Oregon Contract Conditions
O City of La Pine General Conditions
P Exhibit “A” Public Contracting Code
Q Prevailing Wage Rates
R City of La Pine, Oregon 2016 Standards and Specifications
S Oregon Standard Specifications for Construction 2018
T Drawings dated December 2020
U Special Provisions
V ADDENDA:

_____

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in _____ number of copies, each of which shall be deemed an original on the date first above written.

OWNER

_____

By_____

Name _____

(Seal) Title _____

ATTEST:

_____

Name _____

Title _____

CONTRACTOR:

_____

By_____

Name _____

Address_____

(Seal) _____

ATTEST:

_____

Name _____

Title _____

SECTION 10 14 35 - DISABLED PARKING SIGNS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes post-mounted signs for disabled parking signs.

B. Related Sections:

1. Division 03 Section “Cast-in-Place Concrete”, for post-mounted sign footings.
2. Division 32 Section “Pavement Marking”, for surface signage and parking space lines at disabled parking.

1.2 SUBMITTALS

A. Shop Drawings: Indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign.

B. Manufacturer’s Installation Instructions: Include installation template and attachment devices.

1.3 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Shop that employs skilled workers who install products similar to those required for this Project and whose installations have a record of successful in-service performance.

1.4 REGULATORY REQUIREMENTS

A. Comply with 2010 ADA Standards for Accessible Design and State Building Code for accessibility recommendations and requirements for the physically disabled.

B. Provide signs in accordance with local building regulations.

1.5 DEFINITIONS

A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

PART 2 PRODUCTS

2.1 SIGNS FOR DISABLED PARKING

A. Provide metal signs for disabled parking with night reflective surfacing, with the international symbol of accessibility and letters on sign that state "Reserved Parking," or as otherwise required by local jurisdiction.

1. Van Parking Spaces shall contain the designation “Van Accessible.”
2. Sign size shall be as required by local jurisdiction and have a width-to-height ratio between 3:5 and 1:1, and a stroke width-to-height ratio between 1:5 and 1:10.

a. Construction: Aluminum sheet.
b. Minimum Sheet Thickness: 0.080 inches.
c. Nominal Corner Radius: 1/2 inch.

B. Provide color contrasting characters and symbols with light characters on dark background as required by local jurisdiction.

C. Mount signs on a 6x6 juniper post at minimum height of 7'-0" above concrete sidewalk or other paving surface.

1. Verify height with local jurisdiction.

D. Accessories: Mounting Hardware; galvanized screws and anchor bolts.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions and in compliance with 2010 ADA Standards for Accessible Design.

B. Pole Footing: Cast concrete extending 12 inches below frostline.

1. Concrete: Minimum compressive strength of 3,500 psi at 28 days.
2. Trowel finish top of concrete footing to Class B tolerance.

C. Center parking signs on disabled parking spaces.

3.2 ADJUSTING AND CLEANING

A. Relocate misplaced disabled parking signs.

B. Replace defective and damaged sign components.

C. Clean letters and sign face.

END OF SECTION

SECTION 12 93 00 – SITE FURNISHINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Park Bench (Owner Provided, Contractor Installed)

B. Doggie Station (Owner Provided, Contractor Installed)

C. Surface Mount Pedestal Table, 4-Seat (Owner Provided, Contractor Installed)

D. Surface Mount Pedestal Table, 3-Seat ADA (Owner Provided, Contractor Installed)

E. Litter Receptacle (Owner Provided, Contractor Installed)

F. Bicycle Rack (Owner Provided, Contractor Installed)

G. Special Rules Sign (Owner Provided, Contractor Installed)

H. Neighborhood Park Sign (Owner Provided, Contractor Installed)

I. Park Rules Sign (Owner Provided, Contractor Installed)

J. Special Rules Sign (Owner Provided, Contractor Installed)

K. Playground Rules Sign (Contractor Provided, Contractor Installed)

L. Community Park Sign (Owner Provided Sign Graphic and Sign Frame, Contractor Provided Sign Base and Foundation, Contractor Installed)

M. Duro Fixit Bicycle Service Station (Contractor Provided, Contractor Installed)

N. Duro Air Kit 2 Bicycle Pump (Contractor Provided, Contractor Installed)

1.2 RELATED REQUIREMENTS

A. Section 32 13 13 - Site Concrete.

1.3 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures.

B. Contractor to be provided product data for Owner Furnished Contractor Installed items.

C. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Coordinate delivery, handling, and storage of Owner Furnished equipment. Provide equipment to off load trucks and store materials in a dry, covered area, elevated above grade.

B. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.1 As Shown on Plans and per Exhibit D.

2.2 Supplier for Duro; Wildwood Playgrounds; Benjamin Lebwohl @ 503.288.5797

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive furnishings.

B. If substrate preparation is the responsibility of another installer, notify Owner's Representative of unsatisfactory preparation before proceeding.

C. Do not begin installation until unsatisfactory substrates have been properly repaired.

3.2 PREPARATION

A. Ensure surfaces to receive furnishings are clean, flat, and level.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions (See Exhibit B and Plan Set Details.)

B. Install furnishings level, plumb, square, and as indicated on the drawings.

C. Prior to installation review location of furnishings with Owner's Representative for approval. Make adjustments to locations as directed.

3.4 CLEANING

A. Clean installed work to like-new condition. Do not use cleaning materials or methods that could damage finish.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 129300

SECTION 26 01 00
GENERAL ELECTRICAL PROVISIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Description of System.

B. Coordination Requirements

1.2 PROJECT OVERVIEW

A. The attached electrical drawings and specifications show the proposed arrangement of lighting poles, lighting branch circuit requirements and electrical service enclosure.

1.3 QUALITY ASSURANCE

A. Qualifications of Installers:
   1. For actual fabrication, installation and testing of Work of this Section, use only thoroughly trained and experienced personnel familiar with requirements for this Work and with installation recommendations of Manufacturers of specified items.

B. Design Criteria:
   1. Work shall conform with existing field conditions.
   2. Pay for equipment relocations or modifications necessitated by failure to advise Owner of conflicts or coordinate work.

C. Select equipment to meet design conditions stated. Contractor is responsible for meeting technical data and performance requirements of system.

D. Satisfy requirements of regulatory agencies or codes having jurisdiction over project. Provide U.L. labels for all equipment falling under testing capabilities of U.L.

E. Procure licenses and permits, and pay fees, deposits, assessments and tax charges required for Electrical Work.

F. Arrange for and pay for inspections and tests required by codes and ordinances during construction.

1.4 REFERENCE STANDARDS

A. The following specifications and standards, except as hereinafter modified, are incorporated herein by reference and from a part of this specification to the extent indicated by the references thereto. Except where a specific date is given, the issue in effect (including amendments, addenda, revisions, supplements, and errata) on the date of Invitation for Bids shall be applicable. In text such specifications and standards are referred to by basic designation only.
   1. Underwriters Laboratories (UL).
   2. National Fire Protection Association (NFPA), Specifically:
      a. NFPA 70 - National Electric Code.
   3. National Electrical Safety Code.
   4. National Electrical Manufacturer's Association (NEMA).
   5. American National Standards Institute (ANSI).
   6. Occupational Safety and Health Administration (OSHA).
   7. City, County, and State Codes and Ordinances.

1.5 SUBMITTALS

A. Provide shop drawings and product data for the Work of this Division.

B. Submittal material sent by facsimile machine will not be accepted.

C. Post Contract Award:
   1. Prepare and submit as follows:
      a. Provide complete drawings, diagrams, illustrations, performance charts, brochures, and/or other data which adequately describes product to enable thorough evaluation.
      b. Number of copies, method of distribution, format and schedule for submission;
      c. Submit all at one time.
      d. Use 3-ring loose leaf binders for submittals with index referenced to Specification section and page. Tab individual sections.
      e. Do not order or manufacture equipment until full review received from Engineer.
      f. Submit, where applicable, certificates denoting conformance to standards adopted by recognized organizations such as NEMA, UL, OSHA, etc.
      g. Schedule of values.

D. Provide product data for materials and equipment as required by individual sections.

E. Provide Shop Drawings for materials and equipment as required by individual sections.

1.6 SUBSTITUTIONS

A. Products specified herein are so specified to establish a minimum level of product quality. Except where indicated that no substitutions are allowable, equivalent quality products may be submitted to the Architect for approval.

B. Substitution requests will not be considered unless they include the following:
   1. Model numbers of proposed substitutions.
   2. Options which are required to make the proposed substitution comply with Specifications.
   3. Summary of modifications of the Work which are required to accommodate the proposed substitution.

1.7 OPERATION AND MAINTENANCE MANUALS, INSTRUCTION AND TRAINING

A. Manual:
   1. Following installation of electrical equipment, and prior to acceptance of Electrical Work, prepare manuals describing operations, servicing, and maintenance requirements of electrical equipment and systems installed.
   2. Information contained in manual:
      a. Catalog data on each item including complete parts lists, catalog numbers, maintenance information and wiring diagrams.
      b. Service organizations for equipment.
      c. Manufacturer's recommended servicing instructions.
   3. Presentation:
      a. Provide information on neat, clean 8-1/2 inch x 11 inch sheets.
      b. Provide drawings, accordion folded to letter size.
      c. Divide manual into chapters which follow section sequence of Specifications of this Division.
   4. Cover:
      a. Enclose each manual in hardboard post-type binder.
      b. Imprint front of binder with following:
         1) "Electrical Equipment."
         2) Name of Owner, Engineer and Contractor.
         3) Year completed.

B. Instruction and Training:

1. Contractor responsibilities:
   a. Train Owner personnel in operation and maintenance of all installed electrical equipment and systems.
   b. Submit proposed scope of training materials and instruction schedule to Architect for review and approval 30 days prior to scheduled completion of building.
   c. Arrange mutually agreeable dates for training with Owner.

1.8 RECORD DRAWINGS

A. Provide record drawings in O & M Manuals

1.9 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Make inspection of equipment for possible damage at time of delivery to avoid future delays in construction due to replacement or repair.

B. Protect against damage, theft and deterioration.
1. Store in original factory containers.
2. Do not expose equipment to dust, powder, abrasive, wetness, excessive dampness or temperature extremes, unless equipment approved for that use.

C. In event of damage, immediately make all repairs and/or replacements necessary to approval of Architect, at no additional expense to Owner.

1.10 PROTECTION

A. Suitably protect any unfinished Work from potential physical damage.

B. Do not leave unfinished Work unattended, which would pose life safety hazard.

C. Protect other Work against damage and discoloration caused by Work of this Section.

1.11 COORDINATION

A. Report any discrepancies discovered between existing job conditions and Work to be installed. Fully resolve such discrepancies prior to continuation of work.

B. Coordinate sequencing of equipment installation and energizing with other trades.

C. Consult Owner prior to installing equipment in area which obviously exceeds, or will exceed, ambient operating requirements such as for temperature and humidity.

1.12 WARRANTY

A. Warrant all Work included in this Specification for period of one year from date of substantial completion.

B. During warranty period, remedy without delay or expense to Owner any defects providing, in judgment of Engineer, that such defects are not result of misuse or abuse on part of Owner.

C. Warrant that all equipment and installations are in compliance with OSHA regulations.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Provide new material and equipment items that are standard products of Manufacturers regularly engaged in production of such materials and equipment. Owner reserves right to reject items not in accordance with Specifications.

B. Provide corrosion protection for ferrous metalwork exposed to weather by hot dip galvanizing, or factory painted finish suitable for outdoor installations.

C. Verify all materials are acceptable to Authority having jurisdiction, as suitable for the use intended.

PART 3 - EXECUTION

3.1 COMPLETION

A. Complete each system as shown or specified herein and place in operation, except where only roughing-in or partial systems are called for.

3.2 SCHEDULING OF WORK

A. Schedule Work with all other Contractors to maintain job progress schedule, and avoid conflicts in installation of Work by various trades.

3.3 EXCAVATION

A. Contact utilities before starting any excavation to locate underground services on site or in adjacent streets.

B. Locate and protect any existing underground services.

C. Repair any services damaged.

3.4 TRENCHING AND BACKFILLING

A. Provide trenching and backfilling to depth required for underground conduit, per NEC and/or Utility requirements, 36 inches minimum.

B. Backfilling prior to inspection of installation by Owner's representative and serving Utility not permitted.

C. Minimum backfill requirements:
   1. Use 1/4 inch to 1 inch diameter, crushed or clean round river rock for raceway runs beneath building slabs, beneath areas to be paved and beneath streets and sidewalks.
   2. Underground raceway runs at all other locations.
      a. Backfill in compacted layers not exceeding 6 inches in depth.
      b. Use sand or "clean" earth free from rock larger than 1 inch diameter and debris.
   3. Provide one continuous #14 copper conductor as a tracing conductor for locating the conduits in the future. Provide a 6 foot coil of tracing wire at each end of the trench clearly marked on an identification tag: “TRENCH TRACING CONDUCTOR”. Also include the tracing conductor destination and a description of the conduits/conductors in the trench. The identification tag shall be machine generated text, enclosed in a waterproof clear plastic seal, and attached to the coil by means of a tywrap.

D. Trenching and Backfilling for Services:
   1. Coordinate with all utilities for joint trench service Work.
   2. Uncover existing utilities by hand digging only.
   3. Size to accommodate all utility service conduits and accessories.
   4. See joint trench detail on drawings for additional information.

E. Power digging only in direction away from existing facilities.

F. Restore, to Owner's satisfaction at no additional expense, any sidewalks, landscaping, or other existing structure damaged due to excavation.

3.5 MANUFACTURER'S INSTALLATION DETAILS

A. Follow exactly, where available.

B. Provide special wiring or fittings as required.

3.6 ACCESSIBILITY OF EQUIPMENT

A. Install equipment accessible for operation, maintenance or repair as required by NEC.

B. Inaccessible Equipment:
   1. Where the Owner's representative determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, equipment shall be removed and reinstalled as directed, at no additional cost to the Owner.
   2. "Conveniently accessible" is defined as being capable of being reached without the use of ladders, or without climbing or crawling under or over obstacles.

3.7 COORDINATION

A. Coordinate conduit, junction boxes, supporting equipment, etc. Affecting normal operating and maintenance activities related to irrigation equipment, piping, valves, accessories, etc.

3.8 TESTS

A. Fully test and adjust equipment installed under this specifications prior to Owner's personnel instruction. Each system shall be left in proper operation free of faults, shorts or unintentional grounds.

B. Demonstrate essential features of the site lighting control system.

C. Submit to engineer certificate of completed demonstration countersigned by Owner.

3.9 CLEANING OF ELECTRICAL INSTALLATION

A. Prior to acceptance of work, thoroughly clean all exposed portions of electrical installation.

B. Remove all nonessential labels and traces of foreign substances.

C. Use only cleaning solution approved by Manufacturer.

D. Avoid any damage to finished surfaces.

END OF SECTION

SECTION 26 05 30
CONDUIT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Rigid metal conduit and fittings.

B. Intermediate metal conduit and fittings.

C. Electrical metallic tubing and fittings.

D. Flexible metal conduit and fittings.

E. Liquidtight flexible metal conduit and fittings.

F. Non-metallic conduit and fittings.

PART 2 - PRODUCTS

2.1 RIGID STEEL CONDUIT

A. Standard pipe with screwed joints for electrical raceway use.

B. Zinc coated by hot dip galvanizing or sherardizing.

C. Manufacturer: Allied Tube and Conduit, Triangle PWC Inc., Western Tube & Conduit, or approved.

2.2 INTERMEDIATE METALLIC CONDUIT (IMC)

A. Standard pipe with threaded joints for electrical raceway use.

B. Zinc coated by hot dip galvanizing of sherardizing.

C. Manufacturer: Allied Tube and Conduit, Triangle PWC or approved.

2.3 FLEXIBLE CONDUIT

A. Galvanized steel or aluminum, abrasion resistant.

B. Manufacturer: Anamet (Type DE-710), Triangle PWC, Inc. (Type 710), or approved.

2.4 PVC (RIGID PLASTIC) CONDUIT

A. Heavy wall, high impact plastic, Schedule 40 Polyvinyl Chloride.

B. Manufacturer: Carlon, PW Pipe, Triangle PWC, or approved.

2.5 CONNECTIONS AND FITTINGS

A. Especially for purpose used.

B. Same material and finish as raceway.

2.6 UNION JOINTS FOR RIGID STEEL OR IMC CONDUIT

A. Split coupling.

B. Running threads not allowed.

C. Insulated throat.

D. Manufacturer: O.Z. Gedney type "SSP," or approved.

PART 3 - EXECUTION

3.1 CONDUIT SIZING AND ARRANGEMENT

A. Size conduit for Type THW conductors. Minimum conduit size for home runs and underground conduit system is 3/4 inch.

3.2 CONDUIT INSTALLATION

A. Cut conduit square using a saw; de-burr cut ends.

B. Bring conduit to the shoulder of fittings and couplings and fasten securely.

C. Use conduit hubs or sealing locknuts for fastening conduit to cast boxes, and for fastening conduit to sheet metal boxes in damp or wet locations.

D. Install no more than the equivalent of four 90 degree bends between boxes.

E. Use conduit bodies to make sharp changes in direction, as around beams.

F. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 1-1/4 inch size.

G. Avoid moisture traps where possible; where unavoidable, provide junction box with drain fitting at conduit low point.

H. Avoid condensation between moist warm locations and cool locations by blocking air flow in conduit with "Duct Seal" or similar material.

I. Thoroughly clean interior of conduits.

J. Use suitable conduit caps to protect installed conduit against entrance of dirt and moisture.

K. Provide No. 12 AWG insulated conductor or suitable pull string in empty conduit, except sleeves and nipples.

L. Install expansion joints where conduit crosses building expansion or seismic joints.

3.3 RIGID PVC

A. Use limited to underground installations. PVC may not be used above grade.

B. Schedule 40.

C. Provide ground wire full length of circuit.

D. Use rigid steel factory elbows. Extend rigid steel conduit into pole or service enclosure.

E. Wipe plastic conduit clean and dry before joining. Apply full even coat of cement to entire area that will be inserted into fitting. Let joint cure for 20 minutes minimum.

3.4 RIGID STEEL OR INTERMEDIATE METAL CONDUIT

A. Exposed location inside service enclosure.

3.5 UNDERGROUND CONDUIT INSTALLATION

A. Install top of conduit minimum 24 inches below finished grade.

B. Conduit stub-ups to equipment shall be rigid steel.

C. Rigid steel shall extend a minimum 10 feet outside building foundation line and 5 feet outside outdoor concrete pads.

D. Terminate conduit with insulated grounding bushing.

E. Upon completion of conduit installation, seal ducts at building entrances and outdoor equipment terminations with moisture resistant non-hardening compound.

F. Clearances Between Individual Ducts:
   1. For Like Services: Not less than 2 inches.
   2. For High Voltage and Signal Services: Not less than six inches.
   3. Provide plastic spacers to maintain clearances.

END OF SECTION

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Stripping and stockpiling rock.
6. Removing above- and below-grade site improvements.
7. Disconnecting, capping or sealing, and removing site utilities.
8. Temporary erosion and sedimentation control.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for temporary erosion- and sedimentation-control measures.

C. Related Requirements:

1. Section 01500 "Temporary Facilities and Controls" for temporary erosion- and sedimentation-control measures.

1.3 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.

D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable,

pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches (50 mm) in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials.

E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and as indicated on Drawings.

G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: No separate pre-installation conference for site clearing is required.

1.5 MATERIAL OWNERSHIP

A. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.6 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or video recordings.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.

B. Topsoil stripping and stockpiling program.

C. Rock stockpiling program.

D. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

E. Burning: Documentation of compliance with burning requirements and permitting of authorities having jurisdiction. Identify location(s) and conditions under which burning will be performed.

1.7 QUALITY ASSURANCE

A. Topsoil Stripping and Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

B. Rock Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

1.8 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on site.

D. Utility Locator Service: Notify Call Before You Dig for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.

F. Tree- and Plant-Protection Zones: Protect according to requirements in Section 015639 "Temporary Tree and Plant Protection."

G. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to requirements in Section 015639 "Temporary Tree and Plant Protection."

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site according to requirements in Section 015639 "Temporary Tree and Plant Protection."

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.4 EXISTING UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.
2. Owner will arrange to shut off indicated utilities when requested by Contractor.

C. Locate, identify, and disconnect utilities indicated to be abandoned in place.

D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Grind down stumps and remove roots larger than 2 inches (50 mm) in diameter, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
3. Use only hand methods or air spade for grubbing within protection zones.
4. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth of 4 inches (100 mm) in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 STOCKPILING ROCK

A. Remove from construction area naturally formed rocks that measure more than 1 foot (300 mm) across in least dimension. Do not include excavated or crushed rock.

1. Separate or wash off non-rock materials from rocks, including soil, clay lumps, gravel, and other objects larger than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.

B. Stockpile rock away from edge of excavations without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.

1. Limit height of rock stockpiles to 36 inches (900 mm).
2. Do not stockpile rock within protection zones.
3. Dispose of surplus rock. Surplus rock is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus rock to allow later use by the Owner.

3.8 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Burning tree, shrub, and other vegetation waste is permitted according to burning requirements and permitting of authorities having jurisdiction. Control such burning to produce the least smoke or air pollutants and minimum annoyance to surrounding properties. Burning of other waste and debris is prohibited.

C. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for walks, pavements, turf and grasses, and plants.
3. Subbase course for concrete walks and pavements.
4. Subbase course and base course for asphalt paving.
5. Subsurface drainage backfill for walls and trenches.
6. Excavating and backfilling trenches for utilities and pits for buried utility structures.

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for recording preexcavation and earth-moving progress.
2. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
3. Section 329200 "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
4. Section 329300 "Plants" for finish grading in planting areas and tree and shrub pit excavation and planting.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

F. Fill: Soil materials used to raise existing grades.

G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. (0.57 cu. m) or more in volume that exceed a standard penetration resistance of 100 blows/2 inches (97 blows/50 mm) when tested by a geotechnical testing agency, according to ASTM D 1586.

H. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

I. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

J. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: No separate pre-installation conference for Earth Moving is required.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Base Rock
2. Warning tapes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 698.

C. Blasting: Not allowed.

D. Seismic survey report from seismic survey agency.

E. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.7 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify "Call Before You Dig” for area where Project is located before beginning earth-moving operations.

D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures are in place.

E. Do not commence earth-moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.

F. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

G. Do not direct vehicle or equipment exhaust towards protection zones.

H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

1. Liquid Limit Satisfactory native soils must be maintained within a specified optimum moisture content range at time of compaction.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 4 percent of optimum moisture content at time of compaction.

D. Base Course: Aggregate base shall be 3/4"-minus unless otherwise specified.

E. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and zero to 5 percent passing a No. 4 (4.75-mm) sieve.

F. Sand: ASTM C 33/C 33M; fine aggregate.

G. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 6 inches (150 mm) beneath pipe in trenches and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Pile Foundations: Stop excavations 6 to 12 inches (150 to 300 mm) above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches (300 mm) each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches (150 mm) in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
4. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.8 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Compaction: Test subgrade compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing. Space tests at no less than one for each 10,000 sf of in-place soil or part thereof.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Backfill voids with satisfactory soil while removing shoring and bracing.

D. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.

a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

F. Warning Tape: Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.13 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 92 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm).
2. Walks: Plus or minus 1 inch (25 mm).
3. Pavements: Plus or minus 1/2 inch (13 mm).

3.17 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: Specified in Section 334600 "Subdrainage."

B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade, in compacted layers 6 inches (150 mm) thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).
1. Place and compact impervious fill over drainage backfill in 6-inch- (150-mm-) thick compacted layers to final subgrade.

3.18 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
1. Place base course material over subbase course under hot-mix asphalt pavement.
2. Shape subbase course and base course to required crown elevations and cross-slope grades.

3. Place subbase course and base course 6 inches (150 mm) or less in compacted thickness in a single layer.
4. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.19 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.
3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet (30 m) or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet (46 m) or less of trench length but no fewer than two tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.20 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 31 2333 - TRENCHING AND BACKFILLING FOR UTILITIES

PART 1 - GENERAL

1.1 CONTRACT CONDITIONS

A. Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Division 31, Section “Earth Moving”

B. Division 33, Section “Storm Utility Drainage Piping”

C. Division 33, Section “Storm Utility Drainage Piping”

1.3 DEFINITIONS

A. Unstable Soil:

1. Soft, loose, or wet ground that is incapable of supporting materials, equipment, personnel, or structure.

B. AASHTO:

1. American Association of State Highway and Transportation Officials, 341 National Press Building, Washington DC., 2004.

C. Pipe:

1. Water pipe, sewage pipe, storm drain pipe, and electrical conduit.

1.4 OPTIONS

A. All proposed substitutions and areas of use shall be submitted for approval prior to use.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include cut sheet with material descriptions, dimensions of individual components and profiles, colors, finishes, field assembly requirements, and installation details.

1.6 COORDINATION

A. Coordinate with other Trades affecting or affected by Work of this Section.

1.7 REGULATORY AGENCY REQUIREMENTS

A. Obtain and pay for any Permits and Inspections required by governing agencies and utility companies.

1.8 ADVANCE NOTICES

A. Notify Engineer and governing authorities at least 24 hours prior to covering over Work of this Section so that Inspections can be made.

1.9 FIELD MEASUREMENTS

A. Systems layout on Drawings, including existing utility locations, is diagrammatic and may not be exact.

B. Verify prior to fabrication.

C. If field measurements differ slightly from Drawing dimensions modify Work as required for accurate fit. If measurements differ substantially, notify the Owner prior to fabrication.

PART 2 - PRODUCTS

2.1 SOIL AND AGGREGATE MATERIALS

A. Soil and aggregate materials shall be in accordance with those listed in section 31 2000 Earth Moving.

2.2 BURIED UTILITY MARKERS

A. Tracer Wire

1. Material: Bare Solid Copper wire
2. Minimum size: 1 ga.
3. Color:

    a. Over storm drain pipe: Green
    b. Over water pipe: Blue
    c. Over sanitary sewer pipe: Purple or Red

4. Splicing: Make with electrical connectors
5. Successful conductivity testing: Required for system acceptance.

B. Underground Detectable Marking Tape:

1. Manufacturer & Brand: Reef Industries Terra tape, or approved equal.
2. Material: Polyethylene with solid foil core
3. Thickness: 1 mil
4. Width: 6 inches
5. Imprinted message:

    a. "Caution (Type of Utility) Line buried below"
    b. Repeat message over full length of tape.

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

A. Prior to starting work, verify that existing conditions are suitable to perform work.

B. Notify General Contractor about defects requiring correction.

C. Do not start work until conditions are satisfactory.

3.2 SOIL BEARING TESTS

A. Should doubt exist as to bearing capacity of existing soil, tests at Owner's expense may be ordered by the Owner.

3.3 TRAFFIC CONTROL

A. Unless otherwise approved by governing authorities, provide barricades, detours, warning devices, flag men and equipment movement necessary to maintain vehicle and pedestrian traffic on public or private streets and walks.

3.4 PROTECTING OTHER WORK

A. Existing monuments:

1. Carefully maintain bench marks, monuments, and other reference points.
2. If disturbed or destroyed, replace as directed.

B. Existing utilities:

1. Existing utilities shown on Drawings are located according to best available information, but accuracy is not guaranteed.
2. Protect active utility lines encountered; notify Line Owner.
3. Repair or replace active utility lines damaged by work of this Section.

C. Street cleaning:

1. Maintain public and private streets and walkways clean at all times.

D. Dust control:

1. Protect persons and property against damage and discomfort caused by dust. Water as necessary and when directed.

E. Existing trees & plants to remain:

1. Protect against damage.

F. Open trenches:

1. Protect persons and property against injury and damage caused by open trenches.

G. Other work & adjacent property:

1. Protect against damage and discoloration caused by work of this Section.

3.5 INTERFERING EXISTING SIGNS

A. Remove and protect against damage.

B. Provide temporary traffic control signs where necessary.

C. Replace original signs during clean-up operations in locations similar to original location and construction.

3.6 CUTTING EXISTING PAVEMENT

A. Cut prior to excavation with vertical, straight-line joints using pavement saw or other tool designed for cutting pavement.

B. Make cuts parallel or perpendicular to pavement centerline.

C. Cut width: Extend cut 1 ft. beyond each side of trench.

D. Replace pavement to condition at least as good as existing prior to cutting.

3.7 TRENCHING

A. Before starting to excavate:

1. Strip available topsoil from areas to be excavated in accordance with Div 31 “Site Clearing” Section.
2. Stockpile topsoil where and as directed by General Contractor.

B. Excavating:

1. Excavate to lines and grades shown on Drawings or Specifications, unless otherwise directed by the Owner.
2. Allow ample space for pipe and pipe bedding.
3. Leave bearing surfaces undisturbed, level, and true.
4. Hand-grade where necessary.

C. Blasting:

1. Not allowed at this site.

D. Depth:

1. Unless otherwise specified or shown on Drawings, allow for at least 24 inches cover over pipe.

E. Excavation width:

1. Where parallel pipes are to be laid: At least 18 inches wider than sum of inside diameters of parallel pipes plus distance between pipes.
2. Elsewhere: At least 18 inches wider than inside diameter of pipe.
3. Increase widths where directed by Engineer and where necessary to receive shoring.
4. Do not damage adjacent structures or property.
5. Do not extend Excavation beyond construction easements, unless approved by affected Property Owners.

F. Temporary stockpiling of excavated material:

1. Locate within construction area.
2. Unless otherwise approved, do not obstruct private or public streets, drives, or walkways.
3. Locate at least 2 ft. from trench edges. Contractor responsible for safe-loading trenches.
4. At temporary stockpiles remaining during rainy periods, grade and cover stockpile as required to prevent compaction, erosion, and water infiltration.

G. Over-excavation:

1. Where excavation, through Contractor's error is carried to levels lower than those shown on drawings, fill with compacted pipe bedding material to proper levels at no additional cost to Owner.

3.8 EXCESS & UNSUITABLE EXCAVATED MATERIAL

A. Deposit excess material suitable for filling site where directed.

B. Remove from site unsuitable fill material, such as concrete, debris, silt, clay, grasses, weeds, and other deleterious substances which cannot be buried at least 3 ft.

3.9 PIPE BEDDING INSTALLATION

A. Material:

1. Aggregate base

B. Fill full trench width and compact to 95% maximum density per ASTM D 1557.

C. Minimum pipe bedding thickness below pipe bottom: 4 inches.

D. Excavate bell holes at each joint to permit proper joint assembly and inspection.

E. Hand-shape trench bottom to provide uniform, even support over bottom 120 deg. of pipe.

F. Firmly support full pipe length; do not rest bell-to-bell.

3.10 PIPE ZONE MATERIAL INSTALLATION

A. Material:

1. Aggregate base

B. Fill full trench width.

C. Sufficiently compact pipe zone material to prevent pipe movement during final backfilling.

D. At pipe smaller than 15 inches diameter: Backfill with pipe zone material to 10 inches above pipe top.

E. At pipe 15 inches and larger: Backfill up to 12-inches above top of pipe and carefully pack under pipe haunches.

F. Pipe bedding and pipe zone material shall be compacted to 95% of maximum density per ASTM D 1557.

3.11 BURIED UTILITY MARKER INSTALLATION

A. Install tracer wire for non-metallic pipes approximately 6” above the top of buried pipe.

B. Install detectable warning tape 6 to 12 inches below finished grade.

3.12 TRENCH BACKFILLING (12 inches above top of pipe)

A. Remove debris and decayable matter from areas to be filled before proceeding.

B. Make fills as soon as feasible to assure thorough settlement.

C. Do not drop sharp, heavy material onto pipe.

D. Do not use sharp tamping tool around pipe.

E. Do not push backfill material into trench allowing material to free-fall into open trench, until at least 2 feet of Cover is provided over pipe

3.13 COMPACTION OF BACKFILLS (12 inches above top of pipe)

A. Place fills in 6 to 8 inch maximum lifts and compact with mechanical vibration.

B. 95% minimum density under and within 2 ft. of structure foundations, slabs, and pavement; 90% elsewhere.

C. Refer to Section 31 20 00 for testing details.

D. Replace any slabs and pavement which develop settlement cracks during Warranty Period.

E. Regrade any unsurfaced areas where settlement develops during Warranty Period.

3.14 TRENCH BACKFILL MAINTENANCE

A. Continually maintain unsurfaced, backfilled trenches through Construction Period.

3.15 PROTECTING COMPLETED WORK

A. Protect against displacement and intrusion by foreign matter.

B. PRODUCT CLEANING AND REPAIRING

C. Where completed areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

D. Including work of other trades, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of

this Section.

E. Remove debris from Project Site upon work completion, or sooner if directed.

END OF SECTION 312333

SECTION 31 2500 - EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Erosion and Sedimentation Control (ESC) Plan.

B. Related Sections:

1. Division 31 Section “Site Clearing”
2. Division 31 Section “Earth Moving”

1.2 SUBMITTALS

A. Product Submittals:

1. Submit two copies of product data on erosion control materials.

1.3 PERFORMANCE REQUIREMENTS

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

E. ESC facilities shown on drawings are minimum requirements for anticipated site conditions.

1. Upgrade these ESC facilities as needed during construction period for unexpected storm events or site conditions to ensure that sediment and sediment laden water do not leave site.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide materials required for this work.

PART 3 EXECUTION

3.1 INSTALLATION AND MAINTENANCE PROCEDURES

A. Inspect ESC facilities daily and maintain as necessary to ensure continued functioning.

B. Do not allow more than one foot of sediment to accumulate within a trapped catch basin.

1. Clean catch basins and conveyance systems prior to paving.
2. Do not allow cleaning operations to flush sediment laden water into other drainage systems, roadways, or natural waterways.

C. Construct Stabilized Construction Entrances at beginning of construction and maintain for duration of project.

1. Provide additional measures required to ensure paved areas adjacent to project are kept clean for duration of project.

D. Follow guidelines established by Governing Authority for construction and maintenance of graveled construction entrances and temporary sediment barriers.

E. Follow guidelines established by Governing Authority for erosion control work.

F. Provide materials in good physical condition to provide proper sediment retention.

G. Inspect sediment fences and barriers immediately after each rainfall and at least daily during prolonged rainfall and perform required repairs.

END OF SECTION 312500

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cold milling of existing asphalt pavement.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt paving.
4. Hot-mix asphalt overlay.
5. Asphalt curbs.
6. Asphalt traffic-calming devices.
7. Asphalt surface treatments.

B. Related Requirements:

1. Section 024119 "Selective Demolition" for demolition and removal of existing asphalt pavement.
2. Section 312000 "Earth Moving" for subgrade preparation, fill material, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
3. Section 321373 "Concrete Paving Joint Sealants" for joint sealants and fillers at pavement terminations.
4. Section 321400 "Unit Paving" for bituminous setting bed for pavers.

1.3 UNIT PRICES

A. Work of this Section is affected by square yard measurement.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.

b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.
2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
3. Job-Mix Designs: For each job mix proposed for the Work.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and testing agency.

B. Material Certificates: For each paving material, include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.

C. Material Test Reports: For each paving material, by a qualified testing agency.

D. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of Bend LaPine School District, Bend Park and Recreation District, and City of Bend for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
3. Slurry Coat: Comply with weather limitations in ASTM D 3910.

4. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
5. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692/D 692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

C. Fine Aggregate: ASTM D 1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: ASTM D 242/D 242M or AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO M 320, PG 64-28.

B. Asphalt Cement: ASTM D 3381/D 3381M for viscosity-graded material, ASTM D 946/D 946M for penetration-graded material.

C. Emulsified Asphalt Prime Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

D. Tack Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

E. Water: Potable.

F. Undersealing Asphalt: ASTM D 3141/D 3141M; pumping consistency.

2.3 AUXILIARY MATERIALS

A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires, asphalt shingles or glass from

sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.

B. Sand: ASTM D 1073 or AASHTO M 29, Grade No. 2 or No. 3.

C. Joint Sealant: ASTM D 6690 or AASHTO M 324, Type I, hot-applied, single-component, polymer-modified bituminous sealant.

2.4 MIXES

1. Surface Course Limit: Recycled content no more than 10 percent by weight.

B. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction; and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Surface Course: 1/2” Dense Graded Level 2 HMAC

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches (300 mm) into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

C. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

D. Placing Patch Material: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.3 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch (25 mm) in existing pavements.

1. Install leveling wedges in compacted lifts not exceeding 3 inches (75 mm) thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch (6 mm).

1. Clean cracks and joints in existing hot-mix asphalt pavement.
2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.
3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

B. Emulsified Asphalt Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.10 to 0.30 gal./sq. yd. per inch depth (0.5 to 1.40 L/sq. m per 25 mm depth). Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

3.5 PLACING HOT-MIX ASPHALT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents

segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at a minimum temperature of 250 deg F (121 deg C).
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches (25 to 38 mm) from strip to strip to ensure proper compaction of mix along longitudinal joints.
2. Complete a section of asphalt base course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.6 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.7 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to ASTM D 6927 or AASHTO T 245, but not less than 94 percent or greater than 100 percent.
2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent or greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
1. Surface Course: Plus 1/4 inch (6 mm), no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:
1. Surface Course: 1/8 inch (3 mm).
2. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch (6 mm).

3.9 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. Asphalt Traffic-Calming Devices: Finished height of traffic-calming devices above pavement will be measured for compliance with tolerances.

E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

    a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than three cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

F. Replace and compact hot-mix asphalt where core tests were taken.

G. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.10 WASTE HANDLING

A. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes Concrete Paving, including the Following:

1. Driveways.
2. Roadways.
3. Parking lots.
4. Curbs and gutters.
5. Walks.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" Section 033053 "Miscellaneous Cast-in-Place Concrete" for general building applications of concrete.
2. Section 321316 "Decorative Concrete Paving" for stamped concrete other than stamped detectable warnings.
3. Section 321373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.
4. Section 321713 "Parking Bumpers."
5. Section 321723 "Pavement Markings."
6. Section 321726 "Tactile Warning Surfacing" for detectable warning tiles.
7. Section 321729 "Manufactured Traffic-Calming Devices."

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to concrete paving, including but not limited to, the following:

a. Concrete mixture design.
b. Quality control of concrete materials and concrete paving construction practices.

2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete paving Subcontractor.
e. Manufacturer's representative of stamped concrete paving system used for stamped detectable warnings.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Initial Selection: For each type of product, ingredient, or admixture requiring color selection.

C. Samples for Verification: For each type of product or exposed finish, prepared as Samples of size indicated below:

1. Exposed Aggregate: 10-lb (4.5-kg) Sample of each mix.

D. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Bonding agent or epoxy adhesive.
8. Joint fillers.

C. Material Test Reports: For each of the following:

1. Aggregates: Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

D. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Stamped Detectable Warning Installer Qualifications: An employer of workers trained and approved by manufacturer of stamped concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

C. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures.

1.9 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

C. Hot-Weather Concrete Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to

control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 m) or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, fabricated from steel wire into flat sheets.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

C. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

D. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150/C 150M, gray portland cement Type I/II.
2. Fly Ash: ASTM C 618, Class C or Class F.

B. Normal-Weight Aggregates: ASTM C 33/C 33M, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 3/4 inch (19 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Exposed Aggregate: Selected, hard, and durable; washed; free of materials with deleterious reactivity to cement or that cause staining; from a single source, with gap-graded coarse aggregate as follows:

1. Aggregate Sizes: 3/4 to 1 inch (19 to 25 mm

D. Air-Entraining Admixture: ASTM C 260/C 260M.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

F. Water: Potable and complying with ASTM C 94/C 94M.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dryor cotton mat.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

2.6 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.7 STAMPED DETECTABLE WARNING MATERIALS

A. Detectable Warning Stamp: Semirigid polyurethane mats with formed underside capable of imprinting detectable warning pattern on plastic concrete; perforated with a vent hole at each dome.
   1. Size of Stamp: One piece, matching detectable warning area shown on Drawings.

B. Liquid Release Agent: Manufacturer's standard, clear, evaporating formulation designed to facilitate release of stamp mats.

2.8 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

   1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
   2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that comply with or exceed requirements.

B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

   1. Fly Ash or Pozzolan: 25 percent.
   2. Slag Cement: 50 percent.
   3. Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
   1. Air Content: 6 percent plus or minus 1-1/2 percent for 3/4-inch (19-mm) nominal maximum aggregate size.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Concrete Mixtures: Normal-weight concrete.

1. Compressive Strength (28 Days): 3000 psi (20.7 MPa).
2. Maximum W/C Ratio at Point of Placement: 0.45
3. Slump Limit: 4 inches (100 mm), plus or minus 1 inch (25 mm).

2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For concrete batches of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For concrete batches larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph (5 km/h).
2. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch (13 mm) according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch (6-mm) radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooving-tool marks on concrete surfaces.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

D. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further

disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 SPECIAL FINISHES

A. Monolithic Exposed-Aggregate Finish: Expose coarse aggregate in paving surface as follows:

1. Immediately after float finishing, spray-apply chemical surface retarder to paving according to manufacturer's written instructions.
2. Cover paving surface with plastic sheeting, sealing laps with tape, and remove when ready to continue finishing operations.
3. Without dislodging aggregate, remove mortar concealing the aggregate by lightly brushing surface with a stiff, nylon-bristle broom. Do not expose more than one-third of the average diameter of the aggregate and not more than one-half of the diameter of the smallest aggregate.
4. Fine-spray surface with water and brush. Repeat cycle of water flushing and brushing until cement film is removed from aggregate surfaces to depth required.

3.9 DETECTABLE WARNING INSTALLATION

A. Blockouts: Form blockouts in concrete for installation of detectable paving units specified in Section 321726 "Tactile Warning Surfacing."

1. Tolerance for Opening Size: Plus 1/4 inch (6 mm), no minus.

B. Cast-in-Place Detectable Warning Tiles: Form blockouts in concrete for installation of tiles specified in Section 321726 "Tactile Warning Surfacing." Screed surface of concrete where tiles are to be installed to elevation, so that edges of installed tiles will be flush with surrounding concrete paving. Embed tiles in fresh concrete to comply with Section 321726 "Tactile Warning Surfacing" immediately after screeding concrete surface.

C. Stamped Detectable Warnings: Install stamped detectable warnings as part of a continuous concrete paving placement and according to stamp-mat manufacturer's written instructions.

1. Before using stamp mats, verify that the vent holes are unobstructed.
2. Apply liquid release agent to the concrete surface and the stamp mat.
3. Stamping: While initially finished concrete is plastic, accurately align and place stamp mats in sequence. Uniformly load, gently vibrate, and press mats into concrete to produce imprint pattern on concrete surface. Load and tamp mats directly perpendicular to the stamp-mat surface to prevent distortion in shape of domes. Press and tamp until mortar begins to come through all of the vent holes. Gently remove stamp mats.
4. Trimming: After 24 hours, cut off the tips of mortar formed by the vent holes.
5. Remove residual release agent according to manufacturer's written instructions, but no fewer than three days after stamping concrete. High-pressure-wash surface and joint patterns, taking care not to damage stamped concrete. Control, collect, and legally dispose of runoff.

3.10 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture-retaining-cover curing as follows:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any

holes or tears occurring during installation or curing period, using cover material and waterproof tape.

3.11 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 (ACI 117M) and as follows:

1. Elevation: 3/4 inch (19 mm).
2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-feet- (3-m-) long; unleveled straightedge not to exceed 1/2 inch (13 mm).
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches (13 mm per 300 mm) of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch (25 mm).
6. Vertical Alignment of Dowels: 1/4 inch (6 mm).
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches (6 mm per 300 mm) of dowel.
8. Joint Spacing: 3 inches (75 mm).
9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
10. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.12 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 5000 sq. ft. (465 sq. m) or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231/C 231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.13 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 32 1723 - PAVEMENT MARKING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Traffic lane, curb, and parking stall painting and striping.
2. Symbols of accessibility.

B. Related Sections:

1. Division 32 Section “Asphalt Paving”, for substrate.
2. Division 32 Section “Concrete Pavement”, for substrate.

1.2 SUBMITTALS

A. Product Data: Product data sheet for paint to include general properties of paint, surface preparation, application instructions, and cleanup information.

B. Shop Drawings:

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.
2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.
3. Indicate pavement markings, colors, defining basketball court boundary striping and markings.

1.3 SITE CONDITIONS

A. Environmental Requirements:

1. Do not apply marking paint when wind velocity exceeds 15 mph.
2. Do not apply marking paint when pavement temperature is less than 40 degrees F, and ambient air temperature is less than 45 degrees F.

1.4 SCHEDULING

A. Perform pavement marking work after concrete curbs, and walks have been installed and cured.

B. Perform pavement marking work after asphaltic concrete paving has been installed, cured, and sealed.

1.5 REGULATORY REQUIREMENTS

A. Comply with 2010 ADA Standards for Accessible Design and State Building Code for accessibility recommendations and requirements for the physically disabled.

1.6 DEFINITIONS

A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide products by manufacturers indicated in this Section, or approved.

1. Substitutions: Pre-approval by Owner according to requirements of Division 01 Section for “Substitution Procedures.”

2.2 TRAFFIC MARKING PAINT

A. Latex Traffic Marking Paints: Provide products by one of the following:

1. Benjamin Moore: Super Spec HP, Safety & Zone Marking Latex P58.
2. Kelly-Moore: 1472 Zone Marking Paint or 1473 Curb Marking Paint.
3. PPG: ZONELINE, Traffic & Zone Marking Latex, 11-53, 11-54, 11-55, 11-56.
4. Rodda: Professional Maintenance, Driveline, 57341A
5. Sherwin-Williams: Setfast Acrylic Traffic Marking Paint.

B. Alkyd Traffic Marking Paints: Provide products by one of the following:

1. P.P.G. Industries: 11-3 Series.
2. Sherwin-Williams: Setfast Premium Alkyd Zone Marking Paint..

2.3 ACCESSORIES

C. Asphalt Mark-out Materials:

1. Asphalt Emulsion: SS-sh.

D. Mark-Out Paint:

1. Color: Black.
2. Type: Acrylic latex or alkyd oil, flat enamel.

2.5 PAVEMENT MARKING EQUIPMENT

A. Apply paint with motor powered atomizing spray striping machine.

B. Adjust equipment to provide the specified wet film thickness.

PART 3 EXECUTION

3.1 PROTECTION AND PREPARATION

A. Protection: Place temporary barricade and rope or plastic cone barriers to protect striping from vehicular traffic until paint is dry.

B. Surface Preparation:

1. Pressure wash paving surface and blow dry wet areas prior to applying paint.
2. Cover existing striping with black paint where indicated.

3.2 PAVEMENT STRIPING

A. Spray apply paint with straight edges, true alignment, and uniform wet film thickness of 17 mils with thickness variation not to exceed 2 mils.

B. Form disabled accessibility symbols and arrows with templates. Paint color shall comply with local jurisdiction Accessibility Guidelines.

C. Apply white paint to no parking striped paving areas, parking stall dividers, stop bars and cross walks.

D. Apply red paint to curbs where parking is restricted.

E. Apply yellow paint to center lines of two direction drive lanes. .

F. Apply parking area striping in 3 inch wide white lines.

3.3 ADJUSTING

A. Remove misplaced marking paint from concrete surfaces and other surfaces.

B. Cover misplaced paint on asphaltic concrete with asphalt emulsion.

C. Remove and reinstall misplaced marking buttons.

END OF SECTION

SECTION 32 1723 - PAVEMENT MARKING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Traffic lane, curb, and parking stall painting and striping.
2. Symbols of accessibility.

B. Related Sections:

1. Division 32 Section “Asphalt Paving”, for substrate.
2. Division 32 Section “Concrete Pavement”, for substrate.

1.2 SUBMITTALS

A. Product Data: Product data sheet for paint to include general properties of paint, surface preparation, application instructions, and cleanup information.

B. Shop Drawings:

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.
2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.
3. Indicate pavement markings, colors, defining basketball court boundary striping and markings.

1.3 SITE CONDITIONS

A. Environmental Requirements:

1. Do not apply marking paint when wind velocity exceeds 15 mph.
2. Do not apply marking paint when pavement temperature is less than 40 degrees F, and ambient air temperature is less than 45 degrees F.

1.4 SCHEDULING

A. Perform pavement marking work after concrete curbs, and walks have been installed and cured.

B. Perform pavement marking work after asphaltic concrete paving has been installed, cured, and sealed.

1.5 REGULATORY REQUIREMENTS

A. Comply with 2010 ADA Standards for Accessible Design and State Building Code for accessibility recommendations and requirements for the physically disabled.

1.6 DEFINITIONS

A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide products by manufacturers indicated in this Section, or approved.

1. Substitutions: Pre-approval by Owner according to requirements of Division 01 Section for “Substitution Procedures.”

2.2 TRAFFIC MARKING PAINT

A. Latex Traffic Marking Paints: Provide products by one of the following:

1. Benjamin Moore: Super Spec HP, Safety & Zone Marking Latex P58.
2. Kelly-Moore: 1472 Zone Marking Paint or 1473 Curb Marking Paint.
3. PPG: ZONELINE, Traffic & Zone Marking Latex, 11-53, 11-54, 11-55, 11-56.
4. Rodda: Professional Maintenance, Driveline, 57341A
5. Sherwin-Williams: Setfast Acrylic Traffic Marking Paint.

B. Alkyd Traffic Marking Paints: Provide products by one of the following:

1. P.P.G. Industries: 11-3 Series.
2. Sherwin-Williams: Setfast Premium Alkyd Zone Marking Paint..

2.3 ACCESSORIES

C. Asphalt Mark-out Materials:

1. Asphalt Emulsion: SS-sh.

D. Mark-Out Paint:

1. Color: Black.
2. Type: Acrylic latex or alkyd oil, flat enamel.

2.5 PAVEMENT MARKING EQUIPMENT

A. Apply paint with motor powered atomizing spray striping machine.

B. Adjust equipment to provide the specified wet film thickness.

PART 3 EXECUTION

3.1 PROTECTION AND PREPARATION

A. Protection: Place temporary barricade and rope or plastic cone barriers to protect striping from vehicular traffic until paint is dry.

B. Surface Preparation:

1. Pressure wash paving surface and blow dry wet areas prior to applying paint.
2. Cover existing striping with black paint where indicated.

3.2 PAVEMENT STRIPING

A. Spray apply paint with straight edges, true alignment, and uniform wet film thickness of 17 mils with thickness variation not to exceed 2 mils.

B. Form disabled accessibility symbols and arrows with templates. Paint color shall comply with local jurisdiction Accessibility Guidelines.

C. Apply white paint to no parking striped paving areas, parking stall dividers, stop bars and cross walks.

D. Apply red paint to curbs where parking is restricted.

E. Apply yellow paint to center lines of two direction drive lanes. .

F. Apply parking area striping in 3 inch wide white lines.

3.3 ADJUSTING

A. Remove misplaced marking paint from concrete surfaces and other surfaces.

B. Cover misplaced paint on asphaltic concrete with asphalt emulsion.

C. Remove and reinstall misplaced marking buttons.

END OF SECTION

SECTION 328400 – PLANTING IRRIGATION MODIFICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. These specifications refer to project sheets related to modifying existing irrigation to accommodate new features to be constructed in existing areas of the project.

C. Existing irrigation modification to be designed by landscape contractor and reviewed and approved by Owners Representative prior to installation.

1.2 SUMMARY

A. Section Includes:
1. Piping.
2. Encasement for piping.
3. Manual valves.
4. Pressure-reducing valves.
5. Automatic control valves.
6. Automatic drain valves.
7. Transition fittings.
8. Dielectric fittings.
9. Miscellaneous piping specialties.
10. Sprinklers.
11. Quick couplers.
12. Drip irrigation specialties.
13. Controllers.
14. Boxes for automatic control valves.

1.3 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, and specialties. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

D. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

E. Trace Wire: A conductive trace wire used for locating Circuit Piping with an electronic pipe locator after installation.

1.4 PERFORMANCE REQUIREMENTS

A. Irrigation zone control shall be automatic two-wire system operation with controller, decoders, and automatic control valves.

B. Delegated Design: Design 100 percent coverage irrigation system, including comprehensive engineering analysis by a qualified irrigation designer, using performance requirements and design criteria indicated.

C. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:
   1. Irrigation Main Piping: 200 psig.
   2. Circuit Piping: 150 psig.

1.5 ACTION SUBMITTALS

A. Submit shop drawings of complete irrigation system modifications three weeks prior to beginning of work for review by Owners Representative, showing abandonment old irrigation components and connection of new irrigation components.

B. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

C. Wiring Diagrams: For power, signal, and control wiring.

D. Delegated-Design Submittal: For irrigation systems indicated to comply with performance requirements and design criteria, including analysis data by the qualified irrigation designer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For sprinklers controllers and automatic control valves to include in operation and maintenance manuals.

B. Field quality-control testing (post installation), reports.

C. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.

D. Provide as-built markups of shop drawings showing significant changes from original approved drawings.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Spray Sprinklers: Equal to 10 percent of amount installed for each type and size indicated, but no fewer than 2 units.
   2. Bubblers: Equal to 10 percent of amount installed for each type and size indicated, but no fewer than 2 units.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Licensed as a landscape contractor in the State of Oregon and an employer of workers that include a Professional Class member of the American Society of Irrigation Consultants.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.11 PROJECT CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
   1. Notify Owner’s Representative no fewer than two days in advance of proposed interruption of water service.
   2. Do not proceed with interruption of water service without Owner’s Representative's written permission.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. PVC Pipe: Schedule 40 Main piping and Class 200 circuit piping.

   1. ASTM D 1785, PVC 1120 compound, Schedules 40 and 80.
   2. PVC Socket Fittings: ASTM D 2466, Schedules 40 and 80.
   3. PVC Threaded Fittings: ASTM D 2464, Schedule 80.

4. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.

C. PVC Pipe, Pressure Rated: ASTM D 2241, PVC 1120 compound, SDR 21.
   1. PVC Socket Fittings: ASTM D 2467, Schedule 80.
   2. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.

D. Unions
   a. Schedule 80
   b. Body, Nut and End Connector Material: PVC (ASTM F1498)
   c. Pressure Rating: 150 psi.
   d. O Ring Material: EPDM.
   e. Ends: Socket Weld ASTM D2466.
   f. NSF Approved.

2.2 PIPING JOINING MATERIALS

A. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.3 MANUAL VALVES

A. Brass Ball Valves:
   1. Description:
      a. Standard: MSS SP-110.
      b. SWP Rating: 150 psig.
      c. CWP Rating: 600 psig.
      d. Body Design: Two piece.
      e. Body Material: Forged brass.
      f. Ends: Threaded or solder joint if indicated.
      g. Seats: PTFE or TFE.
      h. Stem: Brass.
      i. Ball: Chrome-plated brass.
      j. Port: Full.

B. Valves in first paragraph below are available in NPS 1/4 to NPS 4 (DN 8 to DN 100).

C. Plastic Ball Valves:
   a. ISO 9002
   b. Standard Port
   c. Pressure Rating: 150 psi.
   d. Body Design: Two Piece.
   e. Ball and Body Material: PVC
   f. Handle Material ABS
   g. O Ring: EPDM.

h. Ends: Socket Weld ASTM D2466.
i. NSF Approved.

2.4 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Rain Bird Corporation.
2. Description:
   a. Plastic, Automatic Control Valves:
   b. Molded ABS-plastic body.
   c. Normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

2.5 TRANSITION FITTINGS

A. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

B. Transition Couplings:
1. Description: AWWA C219, metal sleeve-type coupling for underground pressure piping.

C. Plastic-to-Metal Transition Fittings:
1. Description: PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-socket or threaded end.

D. Plastic-to-Metal Transition Unions:
1. Description: MSS SP-107, PVC four-part union. Include one brass or stainless-steel threaded end, one solvent-cement-joint or threaded plastic end, rubber O-ring, and union nut.

2.6 MISCELLANEOUS PIPING SPECIALTIES

A. Water Hammer Arresters: ASSE 1010 or PDI WH 201, with bellows or piston-type pressurized cushioning chamber and in sizes complying with PDI WH 201, Sizes A to F.

B. Pressure Gages: ASME B40.1. Include 4-1/2-inch-diameter dial, dial range of two times system operating pressure, and bottom outlet.

2.7 SPRINKLERS

A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

B. Plastic Rotors:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Rain Bird Corporation**.**

2. Description: Rainbird 6504 Falcon
   a. Body Material: ABS.
   b. Nozzle: ABS.
   c. Retraction Spring: Stainless steel.
   d. Internal Parts: Corrosion resistant.
   e. SAM Check Device.

C. Plastic, Pop-up Spray Sprinklers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Rain Bird Corporation**.**
2. Description:
   a. Body Material: ABS.
   b. Nozzle: ABS.
   c. Retraction Spring: Stainless steel.
   d. Internal Parts: Corrosion resistant.
   e. Pattern: Fixed, with flow adjustment.

D. Plastic Bubbler Sprinklers:
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Rain Bird Corporation
2. Description:
   a. Body Material: ABS or other plastic.
   b. Pattern: Fixed, with flow adjustment.

2.8 QUICK COUPLERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Rain Bird Corporation: Model; 44-RC: 1" (26/34) Rubber Cover, 2-Piece Body

B. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler waterseal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.
1. Locking-Top Option: Vandal-resistant locking feature. Include two matching key(s).

C. Off-Ground Supports: Plastic stakes.

D. Application Pressure Regulators: Brass or plastic housing, NPS 3/4, with corrosion-resistant internal parts; capable of controlling outlet pressure to approximately 20 psig.

E. Filter Units: Brass or plastic housing, with corrosion-resistant internal parts; of size and capacity required for devices downstream from unit.

F. Air Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.

G. Vacuum Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.

2.9 TRACE WIRE

A. Provide 18-gauge direct burial wire (blue) for locating irrigation Circuit Piping.

B. Provide connectors which securely connect wires to the main trace wire, effectively moisture sealed by means of a dielectric non-hardening silicone sealant, and manufacturer approved for direct burial, for splices to establish a continuous run of trace wire.

2.10 CONTROLLERS

C. Manufacturers: Subject to compliance with requirements, provide the following:

Connect two-wire system control wires from new remote-control valves to existing Baseline, Basestation Controller. Coordinate existing controller location and requirements and electrical connection with Owners Representative.

2.11 MASTER VALVE AND FLOW SENSOR

A. Verify that master valve and flow sensor for existing and new irrigation for project is connected to existing Baseline BaseStation.

1. Master valve to be normally open.

2.12 BOXES FOR AUTOMATIC CONTROL VALVES

A. Plastic Boxes:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
a. Armorcast Products Company.
b. Oldcastle, Inc.

B. Orbit Irrigation Products, Inc. or equal:
1. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.
a. Size: As required for valves and service.
b. Shape: Rectangular.
c. Sidewall Material: PE, ABS, or FRP.
d. Cover Material: PE, ABS, or FRP.
1) Lettering: " IRRIGATION."

C. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4 inch minimum to 3 inches maximum.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

B. Install warning tape directly above Irrigation Main Piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

C. Install trace wire directly above Circuit Piping, minimum 10 inches below finished grades.

D. Provide minimum cover over top of underground piping according to the following:
   1. Irrigation Main Piping: Minimum depth of 16 inches below finished grade.
   2. Circuit Piping: 12 inches.
   3. Drain Piping: 12 inches.
   4. Sleeves: 24 inches.

3.2 PREPARATION

A. Set stakes to identify locations of proposed irrigation system. Obtain Owner’s Representative's approval before excavation.

3.3 PIPING SCHEDULE

A. Install components having pressure rating equal to or greater than system operating pressure.

B. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.

C. Underground irrigation main piping, NPS 4 and smaller, shall be one of the following:
   1. Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.
   2. Schedule 80, PVC pipe; Schedule 80, threaded PVC fittings; and threaded joints.
   3. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent cemented joints.

D. Underground irrigation main piping, NPS 5 and larger, shall be one of the following:
   1. Schedule 40 Schedule 80, PVC pipe and socket fittings; and solvent-cemented joints.
   2. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent cemented joints.

E. Circuit piping, NPS 2 and smaller, shall be one of the following:
   1. Class 200 PVC pipe and Schedule 40 socket fittings; and solvent-cemented joints.
   2. SDR 26, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent cemented joints.

F. Circuit piping, NPS 2-1/2 to NPS 4, shall be one of the following:

1. Class 200 PVC pipe and Schedule 40 socket fittings; and solvent-cemented joints.
2. SDR 26, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent cemented joints.

G. Underground Branches and Offsets at Sprinklers and Devices: Schedule 40, PVC pipe; threaded PVC fittings; and threaded joints.
1. Option: Plastic swing-joint assemblies, with offsets for flexible joints, manufactured for this application.

H. Risers to Aboveground Sprinklers and Specialties: Schedule 80, PVC pipe and socket fittings; and solvent-cemented joints.

I. Drain piping shall be one of the following:
1. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
2. SDR 21, 26, or 32.5, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent-cemented joints.

3.4 VALVE SCHEDULE

A. Underground, Shutoff-Duty Valves: Use the following:
1. NPS 2 and Smaller: Curb valve, curb-valve casing, and shutoff rod.
2. NPS 3 and Larger: Iron gate valve, resilient seated; iron gate valve casing; and operating wrench(es).

3.5 PIPING INSTALLATION

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved.

B. Install piping at minimum uniform slope.

C. Install piping free of sags and bends.

D. Install groups of pipes parallel to each other, spaced to permit valve servicing.

E. Install fittings for changes in direction and branch connections.

F. Install unions adjacent to valves and to final connections to other components with NPS 2 or smaller pipe connection.

G. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.

H. Install underground thermoplastic piping according to ASTM D 2774 and ASTM F 690.

I. Install expansion loops in control-valve boxes for plastic piping.

J. Lay piping on solid subbase, uniformly sloped without humps or depressions.

K. Install PVC piping in dry weather when temperature is above 40 deg F. Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.

L. Water Hammer Arresters: Install between connection to building main and circuit valves aboveground or in control-valve boxes.

M. Install piping in sleeves under parking lots, roadways, and sidewalks.

N. Install sleeves made of Schedule 40 PVC pipe and socket fittings, and solvent-cemented joints.

O. Install transition fittings for plastic-to-metal pipe connections according to the following:
   1. Underground Piping:
      a. NPS 1-1/2 and Smaller: Plastic-to-metal transition fittings.
      b. NPS 2 and Larger: AWWA transition couplings.
   2. Aboveground Piping:
      a. NPS 2 and Smaller: Plastic-to-metal transition fittings.
      b. NPS 2 and Larger: Use dielectric flange kits with one plastic flange.

P. Install dielectric fittings for dissimilar-metal pipe connections according to the following:
   1. Underground Piping:
      a. NPS 2 and Smaller: Dielectric coupling or dielectric nipple.
      b. NPS 2-1/2 and Larger: Prohibited except in control-valve box.
   2. Aboveground Piping:
      a. NPS 2 and Smaller: Dielectric union.
      b. NPS 2-1/2 to NPS 4: Dielectric flange.
      c. NPS 5 and Larger: Dielectric flange kit.
   3. Piping in Control-Valve Boxes:
      a. NPS 2 and Smaller: Dielectric union.
      b. NPS 2-1/2 to NPS 4: Dielectric flange.
      c. NPS 5 and Larger: Dielectric flange kit.

3.6 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Flanged Joints: Select rubber gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

H. PE Piping Fastener Joints: Join with insert fittings and bands or fasteners according to piping manufacturer's written instructions.

I. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
   1. Plain-End PE Pipe and Fittings: Use butt fusion.
   2. Plain-End PE Pipe and Socket Fittings: Use socket fusion.

J. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
   1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
   2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
   3. PVC Nonpressure Piping: Join according to ASTM D 2855.

3.7 VALVE INSTALLATION

A. Underground Curb Valves: Install in curb-valve casings with tops flush with grade.

B. Underground Iron Gate Valves, Resilient Seat: Comply with AWWA C600 and AWWA M44.

C. Install in valve casing with top flush with grade.
   1. Install valves and PVC pipe with restrained, gasketed joints.

3.8 SPRINKLER INSTALLATION

A. Install sprinklers after hydrostatic test is completed.

B. Install sprinklers at manufacturer's recommended heights.

C. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries unless otherwise indicated.

D. Install heads 12" off paving and 12" off curbs.

E. Install heads 24" off curbs at vehicle overhangs.

F. Install sprinkler heads after final grading.

3.9 TRACE WIRE INSTALLATION

A. Trace wire shall be installed in the same trench, including through sleeves, with the piping during installation. The wire shall be installed directly above the pipe. The trace wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity.

B. Except for approved spliced-in repair or replacement connections, trace wire shall be continuous and without splices from each trace wire access point.

C. Trace wire access points will be accessible at all automatic control valve locations.

D. Trace wire shall be protected from damage during the execution of the Work. No cuts or breaks in the trace wire or trace wire insulation shall be permitted.

E. At each automatic control valve, a minimum of 3 feet of trace wire will be coiled and secured near the control valve.

F. Contractor shall perform a continuity test on all trace wire in the presence of the Owner's representative. If the trace wire is found to be non-continuous after testing, the Contractor shall repair or replace the failed segment of the wire.

3.10 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

A. Equipment Mounting: Install two-wire system control wires from new remote-control valves to existing Baseline, Basestation Controller. Coordinate with Owners Representative prior to construction.

B. Install control cable in same trench as irrigation piping and at least 2 inches below or beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

3.11 CONNECTIONS

A. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

B. Connect wiring between controllers and automatic control valves utilizing 3M brand DBR Direct Bury Splice Kit waterproof connectors.

3.12 IDENTIFICATION

A. Identify system components.

B. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.
   1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

C. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Section 312000 "Earth Moving" for warning tapes.

3.13 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Any irrigation product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.14 STARTUP SERVICE

A. Perform startup service.
1. Complete installation and startup checks according to manufacturer's written instructions.
2. Verify that controllers are installed and connected according to manufacturer's written instructions.
3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.15 ADJUSTING

A. Adjust settings of controllers.

B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.

C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with finish grade.

D. Adjust and balance system to provide uniform coverage following installation of landscape work.

E. Adjust heads for proper direction and optimum coverage without excessive overthrow on walks and roads.

F. Assure that no spray strikes buildings, roadways, or parked cars.

G. Set controllers to operate system as required.

3.16 CLEANING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

B. Replace all permanent features disturbed by installation.

3.17 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain automatic control valves and controllers.

B. Demonstrate the entire system to owner, showing the remote-control valves are properly balanced, the heads are properly adjusted for radius and arc coverage, and the installed system is working properly.
C. Demonstrate head adjustment, controller and valve operation, and winterization procedures.

3.18 MAINTENANCE

A. The Contractor shall provide a minimum one-year warranty maintenance period unless otherwise specified in the contract documents. The maintenance period shall start on the day following the date of written acceptance of system installation by the Owner’s Representative.

B. After two weeks of operation, flush lines and remove particulates from system. Adjust and clean all filters and/or screens bi-monthly.
C. Review site conditions and adjust components as necessary.

D. Perform one season winterization (blow-out), and one system start-up if requested by Owner’s Representative. Demonstrate start-up and winterizing procedures to operating personnel.

E. Repair and adjust system throughout warranty period, and prior to turning maintenance schedule over to Owner's operating personnel.

END OF SECTION 328400

SECTION 328400 – PLANTING IRRIGATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. These specifications pertain to new construction shown on Sheet L3.2 of the project documents.

1.2 SUMMARY

A. Section Includes:
1. Piping.
2. Encasement for piping.
3. Manual valves.
4. Pressure-reducing valves.
5. Automatic control valves.
6. Automatic drain valves.
7. Transition fittings.
8. Dielectric fittings.
9. Miscellaneous piping specialties.
10. Sprinklers.
11. Quick couplers.
12. Drip irrigation specialties.
13. Controllers.
14. Boxes for automatic control valves.

1.3 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, and specialties. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

D. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.

E. Trace Wire: A conductive trace wire used for locating Circuit Piping with an electronic pipe locator after installation.

1.4 PERFORMANCE REQUIREMENTS

A. Irrigation zone control shall be automatic two-wire system operation with controller, decoders, and automatic control valves.

B. Delegated Design: Design 100 percent coverage irrigation system, including comprehensive engineering analysis by a qualified irrigation designer, using performance requirements and design criteria indicated.

C. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:
   1. Irrigation Main Piping: 200 psig.
   2. Circuit Piping: 150 psig.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Wiring Diagrams: For power, signal, and control wiring.

C. Delegated-Design Submittal: For irrigation systems indicated to comply with performance requirements and design criteria, including analysis data by the qualified irrigation designer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For sprinklers controllers and automatic control valves to include in operation and maintenance manuals.

B. Field quality-control testing (post installation), reports.

C. Controller Timing Schedule: Indicate timing settings for each automatic controller zone.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Spray Sprinklers: Equal to 10 percent of amount installed for each type and size indicated, but no fewer than 2 units.
   2. Bubblers: Equal to 10 percent of amount installed for each type and size indicated, but no fewer than 2 units.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Licensed as a landscape contractor in the State of Oregon and an employer of workers that include a Professional Class member of the American Society of Irrigation Consultants.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.11 PROJECT CONDITIONS

A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
   1. Notify Owner’s Representative no fewer than two days in advance of proposed interruption of water service.
   2. Do not proceed with interruption of water service without Owner’s Representative's written permission.

PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

B. PVC Pipe: Schedule 40 Main piping and Class 200 circuit piping.

   1. ASTM D 1785, PVC 1120 compound, Schedules 40 and 80.
   2. PVC Socket Fittings: ASTM D 2466, Schedules 40 and 80.
   3. PVC Threaded Fittings: ASTM D 2464, Schedule 80.
   4. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.

C. PVC Pipe, Pressure Rated: ASTM D 2241, PVC 1120 compound, SDR 21.
   1. PVC Socket Fittings: ASTM D 2467, Schedule 80.

   2. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.

D. Unions
   a. Schedule 80
   b. Body, Nut and End Connector Material: PVC (ASTM F1498)
   c. Pressure Rating: 150 psi.
   d. O Ring Material: EPDM.

e. Ends: Socket Weld ASTM D2466.
f. NSF Approved.

2.2 PIPING JOINING MATERIALS

A. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.3 MANUAL VALVES

A. Brass Ball Valves:
1. Description:
a. Standard: MSS SP-110.
b. SWP Rating: 150 psig.
c. CWP Rating: 600 psig.
d. Body Design: Two piece.
e. Body Material: Forged brass.
f. Ends: Threaded or solder joint if indicated.
g. Seats: PTFE or TFE.
h. Stem: Brass.
i. Ball: Chrome-plated brass.
j. Port: Full.

B. Valves in first paragraph below are available in NPS 1/4 to NPS 4 (DN 8 to DN 100).

C. Plastic Ball Valves:
a. ISO 9002
b. Standard Port
c. Pressure Rating: 150 psi.
d. Body Design: Two Piece.
e. Ball and Body Material: PVC
f. Handle Material ABS
g. O Ring: EPDM.
h. Ends: Socket Weld ASTM D2466.
i. NSF Approved.

2.4 AUTOMATIC CONTROL VALVES

A. Plastic, Automatic Control Valves

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Rain Bird Corporation.
2. Description:
a. Plastic, Automatic Control Valves:
b. Molded ABS-plastic body.

c. Normally closed, diaphragm type with manual-flow adjustment, and operated by 24-V ac solenoid.

2.5 TRANSITION FITTINGS

A. General Requirements: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

B. Transition Couplings:
   1. Description: AWWA C219, metal sleeve-type coupling for underground pressure piping.

C. Plastic-to-Metal Transition Fittings:
   1. Description: PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-socket or threaded end.

D. Plastic-to-Metal Transition Unions:
   1. Description: MSS SP-107, PVC four-part union. Include one brass or stainless-steel threaded end, one solvent-cement-joint or threaded plastic end, rubber O-ring, and union nut.

2.6 MISCELLANEOUS PIPING SPECIALTIES

A. Water Hammer Arresters: ASSE 1010 or PDI WH 201, with bellows or piston-type pressurized cushioning chamber and in sizes complying with PDI WH 201, Sizes A to F.

B. Pressure Gages: ASME B40.1. Include 4-1/2-inch-diameter dial, dial range of two times system operating pressure, and bottom outlet.

2.7 SPRINKLERS

A. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

B. Plastic, Pop-up Spray Sprinklers:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Rain Bird Corporation**.**
   2. Description:
      a. Body Material: ABS.
      b. Nozzle: ABS.
      c. Retraction Spring: Stainless steel.
      d. Internal Parts: Corrosion resistant.
      e. Pattern: Fixed, with flow adjustment.

C. Plastic Bubbler Sprinklers:
   1. Manufacturers: Subject to compliance with requirements, provide products by the following:
      a. Rain Bird Corporation
   2. Description:

a. Body Material: ABS or other plastic.
b. Pattern: Fixed, with flow adjustment.

2.8 QUICK COUPLERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Rain Bird Corporation: Model; 44-RC: 1" (26/34) Rubber Cover, 2-Piece Body

B. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler waterseal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.
   1. Locking-Top Option: Vandal-resistant locking feature. Include two matching key(s).

C. Off-Ground Supports: Plastic stakes.

D. Application Pressure Regulators: Brass or plastic housing, NPS 3/4, with corrosion-resistant internal parts; capable of controlling outlet pressure to approximately 20 psig.

E. Filter Units: Brass or plastic housing, with corrosion-resistant internal parts; of size and capacity required for devices downstream from unit.

F. Air Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.

G. Vacuum Relief Valves: Brass or plastic housing, with corrosion-resistant internal parts.

2.9 TRACE WIRE

A. Provide 18-gauge direct burial wire (blue) for locating irrigation Circuit Piping.

B. Provide connectors which securely connect wires to the main trace wire, effectively moisture sealed by means of a dielectric non-hardening silicone sealant, and manufacturer approved for direct burial, for splices to establish a continuous run of trace wire.

2.10 CONTROLLERS

A. Manufacturers: Subject to compliance with requirements, provide the following:

1. Connect two-wire system control wires from new remote-control valves to existing Baseline, Basestation Controller. Coordinate existing controller location and requirements and electrical connection with Owners Representative.

2.12 MASTER VALVE AND FLOW SENSOR

A. Verify that master valve and flow sensor for existing and new irrigation for project is connected to existing Baseline BaseStation and operating.

1. Master valve to be normally open.

2.13 BOXES FOR AUTOMATIC CONTROL VALVES

A. Plastic Boxes:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
      a. Armorcast Products Company.
      b. Oldcastle, Inc.

B. Orbit Irrigation Products, Inc. or equal:
   1. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.
      a. Size: As required for valves and service.
      b. Shape: Rectangular.
      c. Sidewall Material: PE, ABS, or FRP.
      d. Cover Material: PE, ABS, or FRP.
         1) Lettering: " IRRIGATION."

C. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4 inch minimum to 3 inches maximum.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."

B. Install warning tape directly above Irrigation Main Piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

C. Install trace wire directly above Circuit Piping, minimum 10 inches below finished grades.

D. Provide minimum cover over top of underground piping according to the following:
   1. Irrigation Main Piping: Minimum depth of 16 inches below finished grade.
   2. Circuit Piping: 12 inches.
   3. Drain Piping: 12 inches.
   4. Sleeves: 24 inches.

3.2 PREPARATION

A. Set stakes to identify locations of proposed irrigation system. Obtain Owner’s Representative's approval before excavation.

3.3 PIPING SCHEDULE

A. Install components having pressure rating equal to or greater than system operating pressure.

B. Piping in control-valve boxes and aboveground may be joined with flanges or unions instead of joints indicated.

C. Underground irrigation main piping, NPS 4 and smaller, shall be one of the following:
   1. Schedule 40, PVC pipe and socket fittings, and solvent-cemented joints.
   2. Schedule 80, PVC pipe; Schedule 80, threaded PVC fittings; and threaded joints.
   3. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent cemented joints.

D. Underground irrigation main piping, NPS 5 and larger, shall be one of the following:
   1. Schedule 40 Schedule 80, PVC pipe and socket fittings; and solvent-cemented joints.
   2. SDR 21, PVC, pressure-rated pipe; Schedule 80, PVC socket fittings; and solvent cemented joints.

E. Circuit piping, NPS 2 and smaller, shall be one of the following:
   1. Class 200 PVC pipe and Schedule 40 socket fittings; and solvent-cemented joints.
   2. SDR 26, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent cemented joints.

F. Circuit piping, NPS 2-1/2 to NPS 4, shall be one of the following:
   1. Class 200 PVC pipe and Schedule 40 socket fittings; and solvent-cemented joints.
   2. SDR 26, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent cemented joints.

G. Underground Branches and Offsets at Sprinklers and Devices: Schedule 40, PVC pipe; threaded PVC fittings; and threaded joints.
   1. Option: Plastic swing-joint assemblies, with offsets for flexible joints, manufactured for this application.

H. Risers to Aboveground Sprinklers and Specialties: Schedule 80, PVC pipe and socket fittings; and solvent-cemented joints.

I. Drain piping shall be one of the following:
   1. Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.
   2. SDR 21, 26, or 32.5, PVC, pressure-rated pipe; Schedule 40, PVC socket fittings; and solvent-cemented joints.

3.4 VALVE SCHEDULE

A. Underground, Shutoff-Duty Valves: Use the following:
   1. NPS 2 and Smaller: Curb valve, curb-valve casing, and shutoff rod.

2. NPS 3 and Larger: Iron gate valve, resilient seated; iron gate valve casing; and operating wrench(es).

3.5 PIPING INSTALLATION

A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved.

B. Install piping at minimum uniform slope.

C. Install piping free of sags and bends.

D. Install groups of pipes parallel to each other, spaced to permit valve servicing.

E. Install fittings for changes in direction and branch connections.

F. Install unions adjacent to valves and to final connections to other components with NPS 2 or smaller pipe connection.

G. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.

H. Install underground thermoplastic piping according to ASTM D 2774 and ASTM F 690.

I. Install expansion loops in control-valve boxes for plastic piping.

J. Lay piping on solid subbase, uniformly sloped without humps or depressions.

K. Install PVC piping in dry weather when temperature is above 40 deg F. Allow joints to cure at least 24 hours at temperatures above 40 deg F before testing.

L. Water Hammer Arresters: Install between connection to building main and circuit valves aboveground or in control-valve boxes.

M. Install piping in sleeves under parking lots, roadways, and sidewalks.

N. Install sleeves made of Schedule 40 PVC pipe and socket fittings, and solvent-cemented joints.

O. Install transition fittings for plastic-to-metal pipe connections according to the following:
   1. Underground Piping:
      a. NPS 1-1/2 and Smaller: Plastic-to-metal transition fittings.
      b. NPS 2 and Larger: AWWA transition couplings.
   2. Aboveground Piping:
      a. NPS 2 and Smaller: Plastic-to-metal transition fittings.
      b. NPS 2 and Larger: Use dielectric flange kits with one plastic flange.

P. Install dielectric fittings for dissimilar-metal pipe connections according to the following:
   1. Underground Piping:
      a. NPS 2 and Smaller: Dielectric coupling or dielectric nipple.
      b. NPS 2-1/2 and Larger: Prohibited except in control-valve box.
   2. Aboveground Piping:
      a. NPS 2 and Smaller: Dielectric union.

b. NPS 2-1/2 to NPS 4: Dielectric flange.
c. NPS 5 and Larger: Dielectric flange kit.

3. Piping in Control-Valve Boxes:
   a. NPS 2 and Smaller: Dielectric union.
   b. NPS 2-1/2 to NPS 4: Dielectric flange.
   c. NPS 5 and Larger: Dielectric flange kit.

3.6 JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Flanged Joints: Select rubber gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

H. PE Piping Fastener Joints: Join with insert fittings and bands or fasteners according to piping manufacturer's written instructions.

I. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
   1. Plain-End PE Pipe and Fittings: Use butt fusion.
   2. Plain-End PE Pipe and Socket Fittings: Use socket fusion.

J. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
   1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
   2. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
   3. PVC Nonpressure Piping: Join according to ASTM D 2855.

3.7 VALVE INSTALLATION

A. Underground Curb Valves: Install in curb-valve casings with tops flush with grade.

B. Underground Iron Gate Valves, Resilient Seat: Comply with AWWA C600 and AWWA M44.

C. Install in valve casing with top flush with grade.
   1. Install valves and PVC pipe with restrained, gasketed joints.

3.8 SPRINKLER INSTALLATION

A. Install sprinklers after hydrostatic test is completed.

B. Install sprinklers at manufacturer's recommended heights.

C. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries unless otherwise indicated.

D. Install heads 12" off paving and 12" off curbs.

E. Install heads 24" off curbs at vehicle overhangs.

F. Install sprinkler heads after final grading.

3.9 TRACE WIRE INSTALLATION

A. Trace wire shall be installed in the same trench, including through sleeves, with the piping during installation. The wire shall be installed directly above the pipe. The trace wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity.

B. Except for approved spliced-in repair or replacement connections, trace wire shall be continuous and without splices from each trace wire access point.

C. Trace wire access points will be accessible at all automatic control valve locations.

D. Trace wire shall be protected from damage during the execution of the Work. No cuts or breaks in the trace wire or trace wire insulation shall be permitted.

E. At each automatic control valve, a minimum of 3 feet of trace wire will be coiled and secured near the control valve.

F. Contractor shall perform a continuity test on all trace wire in the presence of the Owner’s representative. If the trace wire is found to be non-continuous after testing, the Contractor shall repair or replace the failed segment of the wire.

3.10 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

A. Equipment Mounting: Install two-wire system control wires from new remote-control valves to existing Baseline, Basestation Controller. Coordinate with Owners Representative prior to construction.

B. Install control cable in same trench as irrigation piping and at least 2 inches below or beside piping. Provide conductors of size not smaller than recom-

mended by controller manufacturer. Install cable in separate sleeve under paved areas.

3.11 CONNECTIONS

A. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

B. Connect wiring between controllers and automatic control valves utilizing 3M brand DBR Direct Bury Splice Kit waterproof connectors.

3.12 IDENTIFICATION

A. Identify system components.

B. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.
   1. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

C. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches. See Section 312000 "Earth Moving" for warning tapes.

3.13 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
   2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
   3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Any irrigation product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.14 STARTUP SERVICE

A. Perform startup service.
   1. Complete installation and startup checks according to manufacturer's written instructions.
   2. Verify that controllers are installed and connected according to manufacturer's written instructions.
   3. Verify that electrical wiring installation complies with manufacturer's submittal.

3.15 ADJUSTING

A. Adjust settings of controllers.

B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.

C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with finish grade.

D. Adjust and balance system to provide uniform coverage following installation of landscape work.

E. Adjust heads for proper direction and optimum coverage without excessive overthrow on walks and roads.

F. Assure that no spray strikes buildings, roadways, or parked cars.

G. Set controllers to operate system as required.

3.16 CLEANING

A. Flush dirt and debris from piping before installing sprinklers and other devices.

B. Replace all permanent features disturbed by installation.

3.17 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain automatic control valves and controllers.

B. Demonstrate the entire system to owner, showing the remote-control valves are properly balanced, the heads are properly adjusted for radius and arc coverage, and the installed system is working properly.

C. Demonstrate head adjustment, controller and valve operation, and winterization procedures.

3.18 MAINTENANCE

A. The Contractor shall provide a minimum one-year warranty maintenance period unless otherwise specified in the contract documents. The maintenance period shall start on the day following the date of written acceptance of system installation by the Owner’s Representative.

B. After two weeks of operation, flush lines and remove particulates from system. Adjust and clean all filters and/or screens bi-monthly.

C. Review site conditions and adjust components as necessary.

D. Perform one season winterization (blow-out), and one system start-up if requested by Owner’s Representative. Demonstrate start-up and winterizing procedures to operating personnel.

E. Repair and adjust system throughout warranty period, and prior to turning maintenance schedule over to Owner's operating personnel.

END OF SECTION 328400

SECTION 329113 – SOIL PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes planting soils specified by composition of the mixes for general landscape areas.

B. Related Requirements:
   1. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
   2. Section 329200 "Turf" for placing planting soil for turf and grasses.
   3. Section 329300 "Plants" for placing planting soil for plantings.

1.3 DEFINITIONS

A. AAPFCO: Association of American Plant Food Control Officials.

B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or other soil as indicated.

C. CEC: Cation exchange capacity.

D. Compost: Well-composted, stable, and weed-free organic matter, pH of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through a 1-inch sieve; soluble-salt content of 2 to 5 dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
   1. Organic Matter Content: 50 to 60 percent of dry weight.
   2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

   This product should be from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

F. Imported Soil: Soil that is transported to Project site for use.

G. Layered Soil Assembly: A designed series of planting soils, layered on each other that together produce an environment for plant growth.

H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil in accordance with soil fertility report recommendations.

I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through inter-laboratory sample exchanges and statistical evaluation of analytical data.

J. Organic Matter: The total of organic materials in soil exclusive of un-decayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to comply with soil fertility report recommendations. On-site soils shall be tested for soil fertility by a certified testing lab prior to preparation of Planting Soil.

L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

M. SSSA: Soil Science Society of America.

N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

Q. USCC: U.S. Composting Council.

1.4 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include recommendations for application and use.
   2. Include test data substantiating that products comply with requirements.
   3. Include sieve analyses for aggregate materials.
   4. Material Certificates: For each type of imported soil and soil amendment and fertilizer before delivery to the site, according to the following:
      a. Manufacturer's qualified testing agency's certified analysis of standard products.
      b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
      c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Samples: For each bulk-supplied material, 1-quart volume of each in sealed containers labeled with content, source, and date obtained. Each Sample

shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each testing agency.

B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

C. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.
   1. Multiple Laboratories: At Contractor's option, work may be divided among qualified testing laboratories specializing in physical testing, chemical testing, and fertility testing.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing, on-site soil.
   1. Notify Owner’s Representative seven days in advance of the dates and times when laboratory samples will be taken.

B. Preconstruction Soil Analyses: For each un-amended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil Sampling Requirements" and "Testing Requirements" articles.
   1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.9 SOIL-SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by Contractor in presence of Owner’s Representative under the direction of the testing agency.
   1. Number and Location of Samples: Minimum of three representative soil samples from varied locations for each soil to be used or amended for landscaping purposes.
   2. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
   3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.

4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.10 TESTING REQUIREMENTS

A. General: Perform tests on soil samples according to requirements in this article.

B. Physical Testing:
   1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":
      a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
      b. Hydrometer Method: Report percentages of sand, silt, and clay.
   2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
   3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
   4. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D 698 (Standard Proctor).

C. Chemical Testing:
   1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
   2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
   3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
   4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

D. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol of SSSA NAPT WERA-103, including the following:
   1. Percentage of organic matter.
   2. CEC, calcium percent of CEC, and magnesium percent of CEC.
   3. Soil reaction (acidity/alkalinity pH value).
   4. Buffered acidity or alkalinity.
   5. Nitrogen ppm.
   6. Phosphorous ppm.

7. Potassium ppm.
8. Manganese ppm.
9. Manganese-availability ppm.
10. Zinc ppm.
11. Zinc availability ppm.
12. Copper ppm.
13. Sodium ppm.
14. Soluble-salts ppm.
15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
16. Other deleterious materials, including their characteristics and content of each.

E. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium Fertilization, and for micronutrients.
1. Fertilizers and Soil Amendment Rates: State recommendations in weight per 1000 sq. ft. for 6-inch depth of soil.
2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft. for 6-inchdepth of soil.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

B. Bulk Materials:
1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCTS

2.1 PLANTING SOILS SPECIFIED BY COMPOSITION

A. General: Soil amendments, fertilizers, and rates of application specified in this article are guidelines that may need revision based on testing laboratory's recommendations after preconstruction soil analyses are performed.

B. Planting-Soil Type: Existing, on-site surface soil, with the duff layer, if any, retained; and stockpiled on-site; modified to produce viable planting soil in accordance with soil fertility report recommendations.

C. Planting-Soil Type: Imported, naturally formed soil from off-site sources and consisting of sandy loam soil according to USDA textures; and modified to produce viable planting soil equal or exceeding qualities in soil fertility report recommendations.

1. Sources: Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches deep, not from bogs, or marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants including, but not limited to, quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass.
2. Additional Properties of Imported Soil before Amending: Soil reaction of pH 6 to 7 and minimum of 2 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration.
3. Unacceptable Properties: Clean soil of the following:
   a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
   b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 8 percent by dry weight of the imported soil.
   c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 2 inches in any dimension.
4. Amended Soil Composition: Blend imported, unamended soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
   a. Ratio of Loose Compost to Soil: 1:4 by volume.

2.2 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:
1. Feedstock: Limited to leaves.
2. Reaction: pH of 5.5 to 8.
3. Soluble-Salt Concentration: Less than 4 dS/m.
4. Moisture Content: 35 to 55 percent by weight.
5. Organic-Matter Content: 30 to 40 percent of dry weight.

6. Particle Size: Requirement 3/4 (19 mm).
7. Particle Size: Minimum of 98 percent passing through a 2-inch sieve.

2.3 FERTILIZERS

A Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

B. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial grade FeDTPA for ornamental grasses and monocots.

PART 3 - EXECUTION

3.1 GENERAL

A. Place planting soil and fertilizers according to requirements in other Specification Sections.

B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.

C. Proceed with placement only after unsatisfactory conditions have been corrected.

3.2 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply and mix unamended soil with amendments on-site in accordance with soil fertility report recommendations, to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: Till subgrade to a minimum depth of 12 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

C. Mixing: Amend soil to total depth of 6 inches and mix with 12” tilled subgrade, but not less than required to meet finish grades after mixing with amendments and natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

D. Compaction: Compact each blended lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698 and tested in-place.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.3 BLENDING PLANTING SOIL IN PLACE

A. General: Mix amendments, prepared in accordance with soil fertility report recommendations, in-place, with unamended soil to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Preparation: Till unamended existing soil in planting areas to a minimum depth of 12 inches. Remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

C. Mixing: Remove excess subsoil off-site in legal manner if necessary to meet finish grades and apply 6 inches of planting soil amendments and fertilizer, as required, evenly on surface, and thoroughly blend them into full depth of tilled soil.
   1. Mix fertilizer with planting soil no more than seven days before planting.

D. Compaction: Compact blended planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.4 PROTECTION

A. Protection Zone: Identify protection zones according to Section 015639 "Temporary Tree and Plant Protection."

B. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Vehicle traffic.
   4. Foot traffic.
   5. Erection of sheds or structures.
   6. Impoundment of water.
   7. Excavation or other digging unless otherwise indicated.

C. If planting soil or subgrade is over compacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Owner’s Representative and replace contaminated planting soil with new planting soil.

3.5 CLEANING

A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.

END OF SECTION 329113

SECTION 329200 – TURF

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Seeding.
   2. Hydroseeding.
   3. Seeding and Sod

B. Related Requirements:
   1. Section 329300 "Plants" for trees, shrubs, and other plants as well as border edgings and mow strips.
   2. Section 334600 "Subdrainage" for below-grade drainage of landscaped areas.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth in accordance with soil fertility recommendations. See Section 329113 "Soil Preparation" and drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed and Sod: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod and plugs. Include identification of source and name and telephone number of suppliers.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf and meadow establishment and be a licensed landscape contractor in the State of Oregon.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in turf installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Pesticide Applicator: State licensed, commercial.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.8 FIELD CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.
   1. Spring Planting: April 1 to June 30.
   2. Fall Planting: August 1 to October 15.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species:
   1. Quality: State-certified seed of grass species as listed below for solar exposure.
   2. Quality: Seed of grass species as listed below for solar exposure, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed:
   3. Seed: Central Oregon Lawn Mix, available at helenaculver.com (or approved equal).
      a. 60% Kentucky Bluegrass, 40% Perennial Ryegrass

2.2 SOD

A. Sod: Sod shall be a locally grown Bluegrass (33%), Ryegrass (33%), Fescue (34%) Blend. Species Composition may vary based on seasonal availability. Blend by local Central Oregon Grower. Exact sod composition to be approved by Owner’s Representative prior to construction.

   1. Sod shall be grown on sandy loam soil.
   2. Sod shall have no net or netting to remain in or under sod after installation.
   3. Sod shall be cut in large rolls not less than 24” wide and not less than 25’ feet long. Sod shall be cut not less than ½” thick.
   4. Sod shall be dense, lush, healthy, uniform and free of weeds, including weed grasses.

2.3 SOD BID ALTERNATE

A. Sod: Sod shall be a locally grown Bluegrass (33%), Ryegrass (33%), Fescue (34%) Blend. Species Composition may vary based on seasonal availability.

Blend by local Central Oregon Grower. Exact sod composition to be approved by Owner's Representative prior to construction.

1. Sod shall be grown on sandy loam soil.
2. Sod shall have no net or netting to remain in or under sod after installation.
3. Sod shall be cut in large rolls not less than 24" wide and not less than 25' feet long. Sod shall be cut not less than ½" thick.
4. Sod shall be dense, lush, healthy, uniform and free of weeds, including weed grasses.

2.4 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: 1 lb./1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water- insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.5 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
   1. Organic Matter Content: 50 to 60 percent of dry weight.
   2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

C. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

D. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.6 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.7 EROSION-CONTROL MATERIALS

A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
   1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
   2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to Section 329113 "Soil Preparation."

B. Placing Planting Soil: Place and mix planting soil in place over exposed subgrade.
   1. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

D. Before planting, obtain Owner's Representative acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.

C. Fill cells of erosion-control mat with planting soil and compact before planting.

D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph.
   1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
   2. Do not use wet seed or seed that is moldy or otherwise damaged.
   3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate of 6 to 8 lb./1000 sq. ft.

C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas with erosion-control mats where indicated on Drawings; install and anchor according to manufacturer's written instructions.

F. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.
   1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.

G. Protect seeded areas from hot, dry weather or drying winds by applying compost mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch, and roll surface smooth.

3.6 HYDROSEEDING

A. Hydroseeding: Mix specified seed, slow-release fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
   1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
   2. Spray-apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate. Apply slurry cover coat of fiber mulch (hydromulching) at a rate of 1000 lb./acre.

3.7 TURF MAINTENANCE

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
   1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
   2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
   3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Irrigate or install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.
   1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
   2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when

grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow Kentucky bluegrass to a height of 1-1/2 to 2 inches.

D. Turf Post fertilization: Apply commercial fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that provides actual nitrogen of at least 1 lb./1000 sq. ft. to turf area.

3.8 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Owner's Representative:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 95 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.9 SOD INSTALLATION

A. Preparation:

1. Do not begin soding work until finish grades have been approved in writing by Owner's representative.

2. Do not lay sod on subgrades with weed growth. If a time lapse has occurred between grading and sodding allowing weeds to emerge, apply a broad spectrum non-selective contact herbicide to achieve a positive kill prior to sodding. Apply herbicides in strict accordance with manufacturer's instructions and in compliance with all laws. Ensure that herbicides will not have an adverse effect on sod.

3. Adjust grades at edges of curbs and sidewalks so that soil is recessed so that after installation, surface of sod shall be ¼" to 3/4" below adjacent curbs and sidewalks.

4. Preparation for Sodding: After fine grading has been completed, moisten the soil.

B. Delivery, Storage and Handling

1. Deliver sod no later than the day after it is cut.

2. Protect sod after delivery from sun exposure, and drying.
3. Install sod on the day of delivery.

C. Installation:

1. Remove netting, if any, from sod during installation leaving no netting in or under sod.
2. Apply sod to prepared moistened soil so that edges of sod are pressed firmly together.
3. Lay sod with a sod laying machine manufactured for that purpose.
4. Gaps between strips of sod shall not exceed 1/4”.
5. Stagger end seams between adjacent rows.
6. Press sod to soil by rolling with a roller.
7. Contractor shall be repsonsible for irrigiaton of sod to insure healthy and vigorus growth.

3.10 SOD BID ALTERNATE INSTALLATION

A. Preparation:

1. Do not begin soding work until finish grades have been approved in writing by Owner’s representative.
2. Do not lay sod on subgrades with weed growth. If a time lapse has occurred between grading and sodding allowing weeds to emerge, apply a broad spectrum non-selective contact herbicide to achieve a positive kill prior to sodding. Apply herbicides in strict accordance with manufacturer’s instructions and in compliance with all laws. Ensure that herbicides will not have an adverse effect on sod.
3. Adjust grades at edges of curbs and sidewalks so that soil is recessed so that after installation, surface of sod shall be ¼” to 3/4” below adjacent curbs and sidewalks.
4. Preparation for Sodding: After fine grading has been completed, moisten the soil.

D. Delivery, Storage and Handling

1. Deliver sod no later than the day after it is cut.
2. Protect sod after delivery from sun exposure, and drying.
3. Install sod on the day of delivery.

E. Installation:

1. Remove netting, if any, from sod during installation leaving no netting in or under sod.
2. Apply sod to prepared moistened soil so that edges of sod are pressed firmly together.
3. Lay sod with a sod laying machine manufactured for that purpose.
4. Gaps between strips of sod shall not exceed 1/4”.
5. Stagger end seams between adjacent rows.
6. Press sod to soil by rolling with a roller.
7. Contractor shall be repsonsible for irrigiaton of sod to insure healthy and vigorus growth.

3.11 SOD MAINTENANCE

A. Lawn Maintenance:

1. Irrigate lawn areas to keep moist.
2. Do not walk on lawn areas to irrigate, weed, or replace seed, plugs or sod. When required use plywood protection boards to reach lawn areas.
3. Apply lawn fertilizer as per manufacturer’s recommendations and thoroughly water on 14th day of maintenance period.
4. Maintain lawn areas until final acceptance of entire project.
5. First mowing at 2-1/2” maximum grass height, cut grass to 1-1/2 inches and remove clippings.

3.12 SOD BID ALTERNATE MAINTENANCE

A. Lawn Maintenance:

1. Irrigate lawn areas to keep moist.
2. Do not walk on lawn areas to irrigate, weed, or replace seed, plugs or sod. When required use plywood protection boards to reach lawn areas.
3. Apply lawn fertilizer as per manufacturer’s recommendations and thoroughly water on 14th day of maintenance period.
4. Maintain lawn areas until final acceptance of entire project.
5. First mowing at 2-1/2” maximum grass height, cut grass to 1-1/2 inches and remove clippings.

3.13 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.14 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove nondegradable erosion-control measures after grass establishment period.

3.15 TURF MAINTENANCE SERVICE

A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:
   1. Seeded Turf and/or Sod: 90 days from date of Substantial Completion.

      a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

3.16 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within 1 year from date of Substantial Completion.

END OF SECTION 329200

SECTION 329300 – PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 329200 Turf

C. Section 329113 Soil Preparation

1.2 SUMMARY

A. Section Includes:
1. Plants.
2. Tree stabilization.
3. Tree-watering devices.

B. Related Requirements:
1. Section 015639 "Temporary Tree and Plant Protection" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.
2. Section 329200 "Turf and Grasses" for turf , hydroseeding, and erosion-control materials.
3. Section 322910 Landscape Maintenance

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were brown, with a ball size not less than sizes indicated; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than sizes indicated.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than the minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

F. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

G. Finish Grade: Elevation of finished surface of planting soil.

H. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

I. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

J. Planting Area: Areas to be planted.

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to comply with soil fertility report recommendations. On-site soils shall be tested for soil fertility by a certified testing lab prior to preparation of Planting Soil.

L. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

M. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

N. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

O. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials. Substitutions will be considered only with proof of non-availability from five nurseries.
   2. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to Project.

Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 50 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

B Samples for Verification: For each of the following:
1. Trees and Shrubs: Three Samples of each variety and size delivered to site for review. Maintain approved Samples on-site as a standard for comparison.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape contractor licensed in the State of Oregon whose work has resulted in successful establishment of plants.
1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in landscape installation in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
   1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
   2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Owner's Representative may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Owner's Representative may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
   1. Notify Owner's Representative of sources of planting materials seven days in advance of delivery to site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk materials with appropriate certificates.

C. Deliver bare-root stock plants within 24 hours of digging. Immediately after digging up bareroot stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, and keep plants cool and protected from sun and wind at all times.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of

plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 degrees F until planting.

G. Apply anti-desiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
   1. If deciduous trees or shrubs are moved in full leaf, spray with anti-desiccant at nursery before moving and again two weeks after planting.

H. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

I. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
   1. Heel-in bare-root stock. Soak roots that are in less than moist condition in water for two hours. Reject plants with dry roots.
   2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
   3. Do not remove container-grown stock from containers before time of planting.
   4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.9 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
   1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods: From date of Substantial Completion.
   a. Trees, Shrubs, and Ornamental Grasses: 1 year.
   b. Ground Covers, Biennials, Perennials, and Other Plants: 1 year.
3. Include the following remedial actions as a minimum:
   a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
   b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
   c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
   d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
   1. Nursery grown plants shall be grown locally or be acclimatized to the High Desert region for a minimum of 90 days before delivery to site.
   2. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots are unacceptable.

   3. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery except as harvested from site.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Owner’s Representative, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

2.2 MULCHES

A. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through a 1-inch sieve; soluble-salt content of 2 to 5 dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
   1. Organic Matter Content: 50 to 60 percent of dry weight.
   2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

2.3 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.4 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:
   1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
   2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or compression springs.

2.5 MISCELLANEOUS PRODUCTS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

B. Burlap: Non-synthetic, biodegradable.

C. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb. of vesiculararbuscular mycorrhizal fungi and 95 million spores per lb. of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
   3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   4. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Owner's Representative and replace with new planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Owner's Representative's acceptance of layout before excavating or planting. Make minor adjustments as required.

3.3 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil according to Section 329113 "Soil Preparation."

B. Placing Planting Soil: Place and mix planting soil in-place over exposed subgrade.

C. Before planting, obtain Owner's Representative's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.
   1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
   2. Excavate approximately three times as wide as ball diameter for balled and burlapped stock.
   3. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock per plan sheet details.
   4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
   5. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
   6. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
   7. Maintain supervision of excavations during working hours.
   8. Keep excavations covered or otherwise protected after working hours.
   9. If drain tile is indicated on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

C. Obstructions: Notify Owner’s Representative if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Drainage: Notify Owner’s Representative if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB AND GRASS PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
   1. Backfill: Planting soil. For trees, use excavated soil for backfill.
   2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do
      not use planting stock if root ball is cracked or broken before or during planting operation.
   3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
   4. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
   1. Backfill: Planting soil. For trees, use excavated soil for backfill.
   2. Carefully remove root ball from container without damaging root ball or plant.
   3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
   4. Continue backfilling process. Water again after placing and tamping final layer of soil.
   5. Backfill: Planting soil. For trees, use excavated soil for backfill.
   6. Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
   7. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
   8. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 TREE AND SHRUB PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines as directed by Owner's Representative.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Owner's Representative, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.7 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:
   1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend one-third of trunk height above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
   2. Upright Staking and Tying: Stake trees with two stakes for trees up to 12 feet high and 21/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
   3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
   4. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

3.8 PLANTING AREA MULCHING

A. Compost Mulch backfilled surfaces of planting areas and other areas indicated.
   1. Compost Mulch in Planting Areas: Apply 3-inch average thickness of organic compost mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 6 inches of trunks or stems.

3.9 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.10 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Nonselective): Apply to tree, shrub, and ground-cover areas according to manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.11 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Owner’s Representative.
   1. Submit details of proposed pruning and repairs.
   2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
   3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Owner’s Representative.

B. Remove and replace trees that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Owner’s Representative determines are incapable of restoring to normal growth pattern.

3.12 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.13 MAINTENANCE SERVICE

A. Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:
   1. Maintenance Period: 12 months from date of Owner Acceptance of Substantial Completion.

B. Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance". Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:
   1. Maintenance Period: 12 months from date of Owner Acceptance of Substantial Completion.

END OF SECTION 329300

SECTION 33 40 00 - STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Work consists of complete installation of drainage pipe including trench excavation, backfill, compaction, ductile iron pipe, and all appurtenances, including but not limited to outfall protection.

B. Related Sections
1. Section 31 2000 – Earth Moving
2. Section 31 2333 – Trenching and Backfilling for Utilities
3. Section 32 1216 – Asphalt Paving

1.2 SUBMITTALS

A. Product Data.

1. Pursuant to Section 01 3300- Submittal Procedures.
2. Manufacturer’s data for each item specified in PART 2 PRODUCTS.
3. General catalog data showing the following (if applicable):
   a. Pipe and wall thickness
   b. Gaskets
   c. Push-on joints
   d. Shop coating and lining

1.3 DELIVERY, STORAGE, AND HANDLING

A. Packing, Shipping, Handling, and Unloading:

1. Materials shall be shipped to the site by means that do not cause damage.
2. Unload pipe only by approved means. Do not unload pipe of any size by dropping to the ground.
3. Do not distribute more than one week’s supply of material in advance of laying.
4. Materials stored at the site for more than 10 days shall be protected from the effects of weathering.
5. Inspect pipe and fittings prior to installation, checking for cracked, broken, or otherwise defective materials. Acceptance of delivered materials does not preclude final acceptance of completed Work.
6. Damaged or defective materials shall not be installed. Costs for removal and replacement of defective materials will be borne by the Contractor.

B. Acceptance at Site

1. Materials shipped to the job site will be checked for certification of conformance by the manufacturer. Pipe or fittings found to not match the certification shall be immediately removed from the site.

C. Storage and Protection

1. Materials shall be stored in such a manner as to preclude damage.
2. Pipe and fittings that have become rusty or otherwise damaged shall not be installed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General

1. Pipe shall be new, free of cracks, holes, foreign inclusions or other injurious defects.
2. Each piece of pipe shall be clearly identified as to strength, class, and date of manufacture.
3. Unless otherwise shown on the Contract Documents, minimum length of pipe shall be 3.5 feet.
4. Do not coat pipe internally or externally with any substance of any type in an attempt to improve its performance when air or hydrostatically tested.
5. Use pipe and fittings of one type of material throughout. No interchanging of pipe and fittings will be allowed, unless otherwise shown on the Contract Documents.
6. Crushed rock material shall be hard, durable rock with angular fractured faces.

B. Storm Drain Pipe

1. Pipe: Polyvinyl Chloride (PVC) pipe shall be ANSI/ASTM D3034, SDR 35, bell and spigot style with rubber gaskets.
2. Fittings: Shall be of the same material as the pipe, molded or formed to suit the pipe size and design, in required tees, bends, elbows, etc. as required.

C. Ductile Iron Pipe

1. Pipe: Ductile Iron in accordance with ASTM A 746, for push-on joints. Pressure class 250.

2. Fittings: AWWA C110, ductile or gray iron, for push-on joints.

3. Gaskets: AWWA C111, rubber

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation

1. Excavate to the lines and grades shown on the plans.
2. If material in bottom of excavation is unsuitable for pipes and other water appurtenances, excavate below subgrade as directed and backfill to required grade with ¾" – 0 crushed rock compacted to 95% of maximum density per AASHTO T-99.

B. Material Preparation

1. Clean the interior of pipe and fittings of foreign matter prior to installation. Before jointing, wire brush joint contact surfaces if necessary, wipe clean, and keep clean until jointing is completed.

3.2 INSTALLATION

A. General:

1. Cutting and jointing to be completed per manufacturer's recommendations.
2. Trenching and backfilling shall be performed in accordance with section 31 23 33 Trenching and Backfilling for Utilities.
3. Line and Grade for drainage pipe
   a. Do not deviate from line or grade more than 1/2-inch for line and 1/4-inch for grade, provided that such variation does not result in a level or reverse sloping invert.
   b. Measure for grade at the pipe invert, not at the top of the pipe.
   c. Establish line and grade for pipe by the use of approved lasers or by transferring the cut from the offset stakes to batter boards at maximum intervals of 25 feet. If batter boards prove impractical because of trench conditions, submit other methods of grade and alignment control for approval by the Project Engineer.
   d. When installed under concrete sidewalk pavement maintain a minimum 12" of cover over pipe unless otherwise specified by the manufacturer.

B. Rock Outfall

1. Over excavate as needed to place rounded rock as shown on plans.

C. Pipe and Fittings

1. Proceed with pipe laying upgrade with spigot or tongue ends pointing in direction of flow.

2. Place pipe in such a manner as to ensure solid bearing between the pipe and the full cross sectional accordance with the recommendations of the manufacturer.
3. Take care to properly align the pipe before joints are forced entirely home.
4. Gaps at pipe joints shall not exceed that allowed by the manufacturer's recommendations.
5. After installation prevent movement from any cause including uplift or floating.
6. Take special care to prevent movement of the pipe, compacted pipe bedding and pipe zone after installation when laid within a movable trench shield.
7. When laying operations are not in progress, protect the open end of the pipe from entry of foreign material and block the pipe to prevent movement or creep of gasketed joints.
8. Provide all sewer pipes, 36 inches or smaller in diameter, entering or leaving ditch inlet or other structures, with flexible joints within 18 inches of the exterior wall. Pipes larger than 36 inches in diameter shall have this flexible joint within a distance from the exterior wall equal to 1-half the inside pipe diameter.
9. When shown or approved to deflect pipe from a straight line, either in the vertical or horizontal plane, or when long-radius curves are shown, the amount of deflection allowed shall not exceed that specified. The pipe manufacturer's recommendations will serve as a guide but the decision of the Owner shall be final.

D. Push-on Joints

1. Follow pipe manufacturer's instructions and recommendations for proper jointing procedures.
    a. Provide lubricant suitable for use in potable water, stored in closed containers, and kept clean. Prepare pipe ends for restrained joint pipe in accordance with the pipe manufacturer's recommendations.

3.3 TESTING

A. Testing shall be in accordance with the Uniform Plumbing Code and/or Deschutes County requirements, as applicable.

B. Deflection Testing of Plastic Drainage and Sewer Pipe:

1. The Contractor shall conduct deflection tests of storm drains constructed of plastic pipe to ensure pipe has maintained its shape after compaction.
2. The testing shall be conducted by pulling an approved mandrel through the completed pipeline.
    a. The diameter of the mandrel shall be 95 percent of the pipe initial diameter.

3. Pipe with deflection exceeding 5 percent of the inside diameter shall have backfill removed and replaced to provide a deflection of less than 5 percent.

    a. Any repaired pipe shall be retested.

3.4 REPAIR/RESTORATION

A. Pipe, fittings, gaskets, and fasteners damaged during placement shall be replaced prior to backfilling. Do not attempt to repair these items. Damaged items shall be replaced at the Contractor's expense.

3.5 CLEANING

A. Including work of other trades, clean, repair and touch-up, or replace when directed, products which have been soiled, discolored, or damaged by work of this Section.

B. Remove debris from project site upon work completion or sooner, if directed.

C. Before completion of any underdrain system and prior to backfilling, remove any silt, debris, and foreign matter that may have collected in the system.

D. Remove all accumulated construction debris, rocks, gravel, sand, silt, and other foreign material from the sewer system.

E. Foreign matter still present in the system upon Project Engineer's final manhole-to- manhole inspection of the sewer system shall be removed before acceptance of that Section.

END OF SECTION 334000

SECTION 33 49 00 - STORM DRAINAGE STRUCTURES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stormwater inlets

B. Related Requirements:

1. Section 33 41 00 – Stormwater Piping
2. Section 03 30 00 – Cast-in-Place Concrete
3. Section 31 23 33 – Trenching and Backfilling for Utilities.

1.2 REFERENCES

A. ASTM International:
1. ASTM A 536 - Standard Specification for Ductile Iron Castings
2. ASTM C857 - Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
3. ASTM C890 - Standard Practice for Minimum Structural Design Loading for Monolithic or Section Precast Concrete Water and Wastewater Structures.
4. ASTM C891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures.
5. ASTM C 913 - Standard Specification for Precast Concrete Water and Wastewater Structures

1.3 SUBMITTALS (Product to be approved by EOR)

A. Submit under provisions of Section 01 33 00 – Submittal Procedures.

B. Product Data: Submit data for inlet tops, grade adjustment rings, grates.

C. Shop Drawings: Indicate structure locations, elevations, sections, equipment supports, and sizes and elevations of penetrations.

1.4 QUALITY ASSURANCE

A. Regulatory Compliance:
1. Comply with applicable portions of federal, state and local environmental agency regulations pertaining to storm drainage systems.
2. Comply with local municipal and county regulations and standards pertaining to storm drainage systems in accordance with approved plan.

B. Source Quality Control:
1. Precast concrete supplier plant shall be registered and certified under

either the Prestressed Concrete Institute (PCI) or the National Precast Concrete Association (NPCA) plant certification program.

2. Maintain uniform quality of products and component compatibility by using the products of one manufacturer in the case of precast reinforced concrete structures.

1.5 DELIVERY, STORAGE AND HANDLING

A. Comply with Section 01 61 00 Product Requirements

B. Comply with precast concrete manufacturer's instructions and ASTM C913 for unloading, storing and moving precast structures.

C. Store precast concrete structures to prevent damage to public or private property. Repair property damaged from materials storage.

PART 2 PRODUCTS

2.1 INLETS

A. Precast Concrete Inlets: precast reinforced concrete, of depth indicated. The top section shall match the frame and grate for the inlet type specified.

1. Materials
   a. Base Section: 6" minimum thickness for floor slab and 6" minimum thickness of walls and base riser section for rectangular structures and 5" minimum thickness of walls and base riser section for 48" circular structures and having a separate base slab or a base section with integral floor.
   b. Riser Sections: 6" minimum thickness for rectangular structures and 5" minimum thickness for 48" circular structures and lengths required to provide the depth indicated.
   c. Top Section: Flat slab type with opening to match grade rings and frame and grate.
   d. Grade Rings: Provide maximum of 2 reinforced concrete rings as required and necessary. Match dimensions of frame and grate.
   e. Gaskets: ASTM C 443, rubber.
   f. Pipe Connectors: ASTM C 270-91a, "Standard Specification for Mortar for Unit Masonry" requirements. Mortar joints shall be smooth and flush with manhole walls.
   g. Channel and Bench: Concrete.
   h. Corner intersections of pipes and structures are prohibited.

B. Frames and Grates: As shown on the Drawings, either structural steel, or gray, malleable, or ductile iron.

1. Materials
   a. Coat structural steel with bituminous paint in the shop or in the field, prior to placement. Cover frames and grates completely with no pin holes or voids.
   b. All grates shall be bicycle safe.

PART 3 EXECUTION

3.1 PREPARATION

A. Coordinate placement of inlet and outlet pipe required by other sections.

B. Inspect ~~precast concrete~~ structures immediately prior to placement in excavation to verify are internally clean and free from damage. Remove and replace damaged units.

3.2 INSTALLATION

A. Excavation and Backfill:
   1. Excavate for utility structure in accordance with Section 31 23 33 in location and to depth shown. Provide clearance around sidewalls of structure for construction operations.
   2. When groundwater is encountered, prevent accumulation of water in excavations.
   3. Place structure in dry trench.

B. Install structure supported at proper grade and alignment on compacted 3/4" - minus bedding (min. 6" depth).

C. Lift precast concrete structures at lifting points designated by manufacturer.

D. Install precast concrete base to elevation and alignment indicated on Drawings.

E. Locate pipe(s) as indicated on plan and cut pipe to finish flush with concrete face. Connect pipe(s) to inlets and manhole structures with watertight connection.
   1. When using prefabricated pipe opening seals (i.e., A-LOK, etc.) for connecting pipes into manholes, fill such annular spaces with preformed plastic sealing compound.
   2. For other pipe connections: grout all pipe entries flush to interior walls for watertight connection.

F. Inlet Frame and Grate Installation: Where required, make final adjustment of frame to elevation using precast grade rings. Frame and Covers installed within paved areas shall be set at 1/8" below final pavement elevation. Frame and Covers installed in all other areas shall be set within 1/8" of final grade elevations, with exception of manholes with rim elevations identified above final grade elevations.
   1. Waterproof Mortar. Mortar thickness not to exceed 1/2-inch maximum and 3/8- inch minimum. Wet, but do not saturate precast grade rings immediately before laying.

END OF SECTION 334900

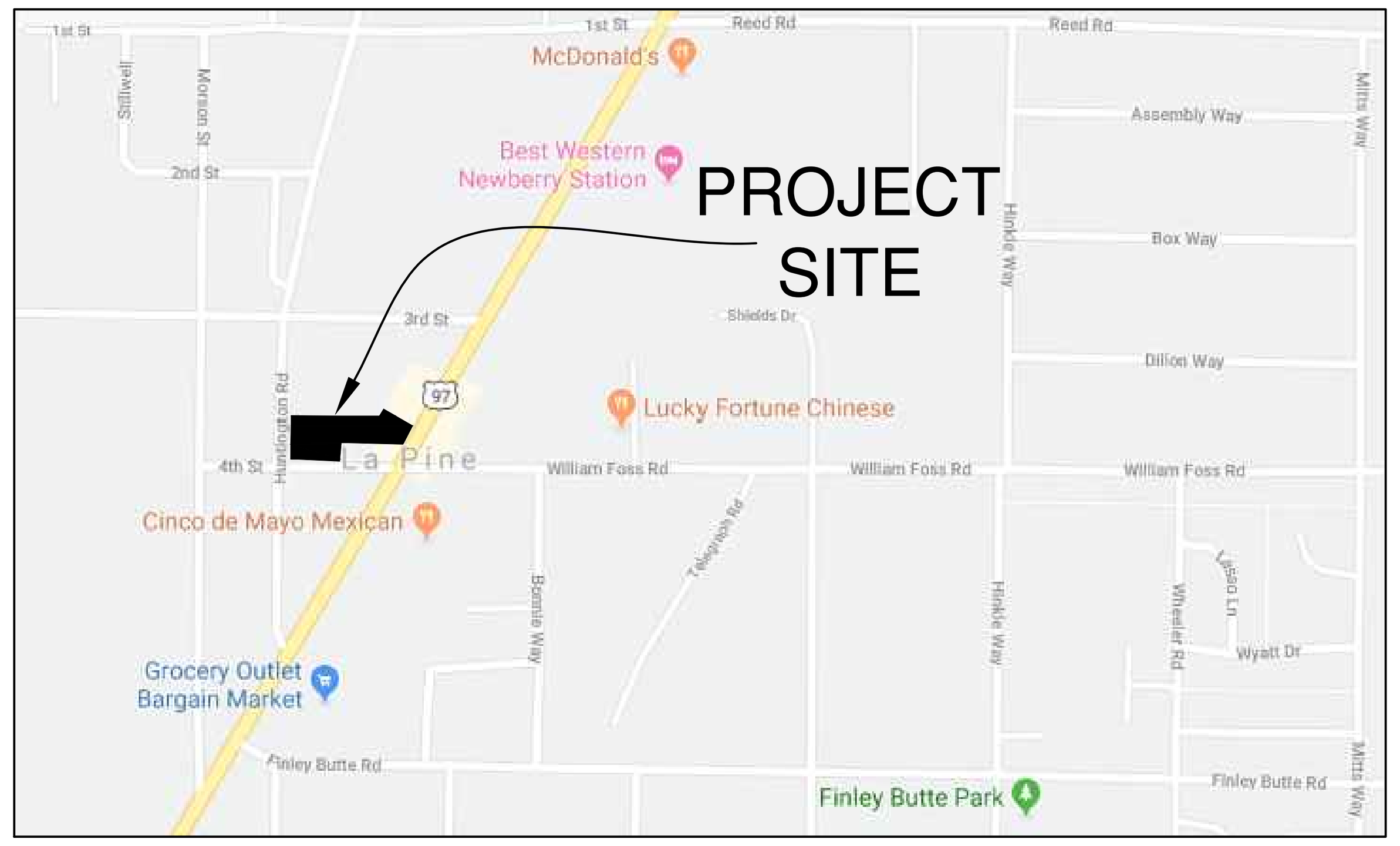
4TH STREET TRANSIT CENTER

DEVELOPMENT PLANS

TAXLOT: 221014BC 00100

SEPTEMBER 2020

CITY OF LA PINE, DESCHUTES COUNTY, OREGON



VICINITY MAP

SCALE: NTS

PROPERTY OWNER:

OREGON DEPARTMENT OF TRANSPORTATION
4040 FAIRVIEW INDUSTRIAL DR SE #MS-2
SALEM, OREGON 97739

CIVIL ENGINEER & LAND SURVEYOR:

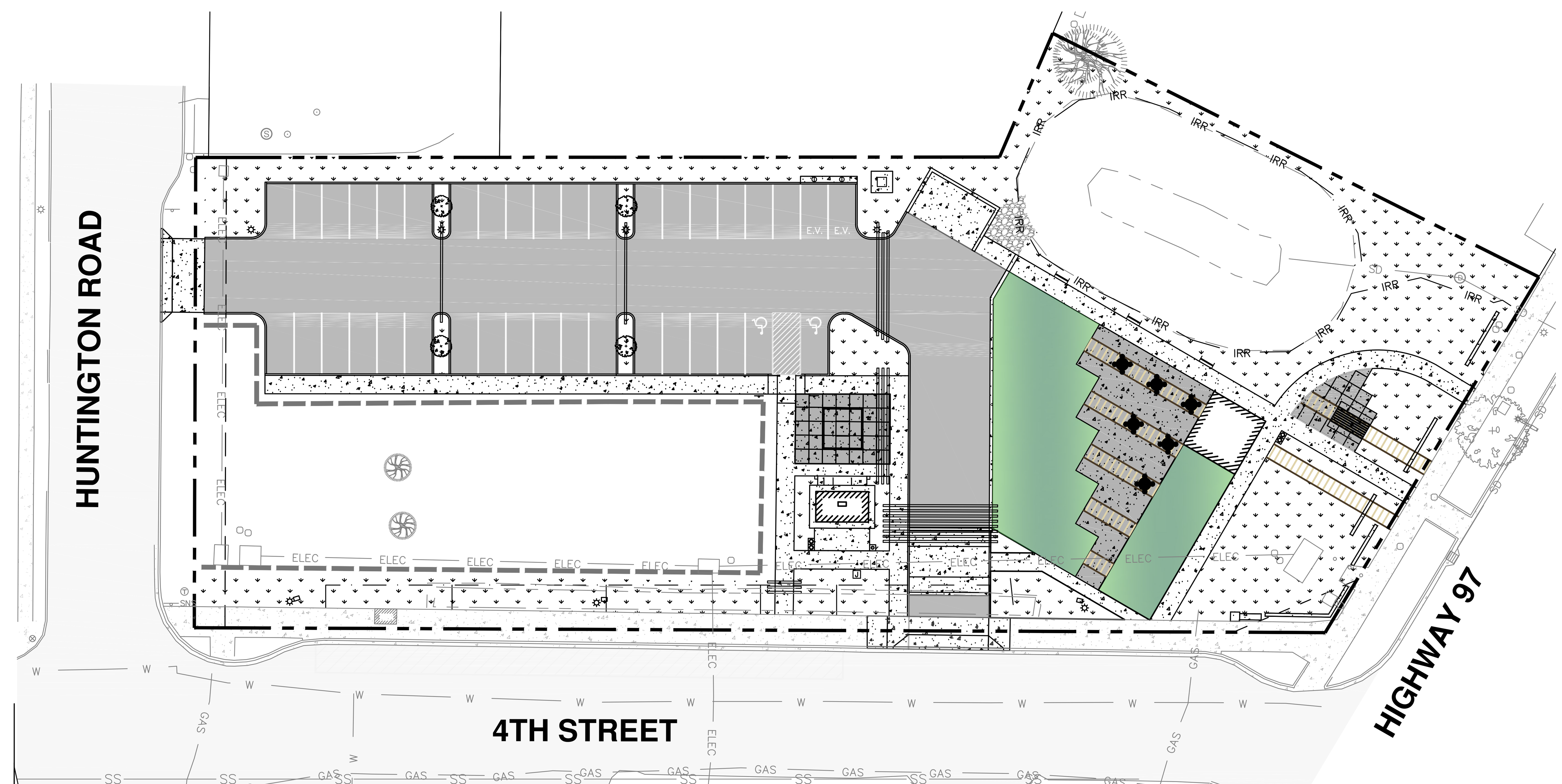
BECON CIVIL ENGINEERING & LAND SURVEYING
549 SW MILL VIEW WAY, SUITE 100
BEND, OREGON 97702

LANDSCAPE ARCHITECT:

KATRINA LANGENDERFER
48 SE BRIDGEFORD BLVD SUITE 230
BEND, OR 97702

CONSTRUCTION NOTES:

1. NO CONSTRUCTION SHALL BE STARTED WITHOUT APPROVAL BY THE CITY OF LA PINE. THE CITY AND THE DESIGN ENGINEER SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY CONSTRUCTION WORK DONE PRIOR TO NOTICE TO PROCEED BEING ISSUED OR WITHOUT INSPECTION WILL BE REJECTED.
2. CONTRACTOR SHALL VERIFY ALL CONDITIONS ON THE JOB SITE INCLUDING BUT NOT LIMITED TO, ALL DIMENSIONS, GRADES, ELEVATIONS, EXTENT AND COMPATIBILITY TO THE EXISTING SITE CONDITIONS, AND WITH THE WORK DESCRIBED ON THE ENGINEER'S DRAWINGS. ANY DISCREPANCIES OR UNEXPECTED CONDITIONS THAT AFFECT OR CHANGE THE WORK DESCRIBED IN THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY. CONTRACTOR SHALL NOT PROCEED WITH ANY OF THE WORK IN THE AREA OF DISCREPANCIES UNTIL ALL SUCH DISCREPANCIES ARE RESOLVED. IF THE CONTRACTOR CHOOSES TO DO SO, THEN IT IS UNDERSTOOD THAT THE CONTRACTOR IS CHOOSING TO PROCEED AT THE CONTRACTOR'S OWN RISK AND SHALL INCUR ALL COSTS, IF ANY TO RESOLVE THE ISSUES TO THE SATISFACTION OF THE ENGINEER.
3. A CITY INSPECTOR ACTING ON BEHALF OF THE CITY MAY REQUIRE REVISIONS IN PLANS TO SOLVE UNFORESEEN PROBLEMS THAT MAY ARISE IN THE FIELD.
4. ALL CONSTRUCTION WORK AND INSTALLATIONS SHALL CONFORM TO CURRENT CITY OF LA PINE STANDARDS & SPECIFICATIONS REQUIREMENTS, AND ALL WORK SHALL BE SUBJECT TO THE APPROVAL OF THE CITY.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT "UNDERGROUND LOCATE SERVICE" AT 1-800-332-2344 AT LEAST 48 BUSINESS-DAY HOURS PRIOR TO THE START OF CONSTRUCTION FOR THE LOCATION OF POWER, GAS, CABLE TV AND TELEPHONE UNDERGROUND FACILITIES. THE CONTRACTOR WILL ALSO BE RESPONSIBLE FOR CONTACTING THE APPROPRIATE PUBLIC AGENCY FOR THE LOCATION OF UNDERGROUND FACILITIES.
6. ALL UTILITIES SHOWN ARE ACCURATE TO THE EXTENT OF AVAILABLE RECORDS AND KNOWLEDGE. NO POTHOLING TO VERIFY LOCATIONS AND ELEVATIONS HAS BEEN PERFORMED. THE CONTRACTOR HAS THE TOTAL RESPONSIBILITY TO VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES AND TO NOTIFY THE UTILITY COMPANIES WHEN WORKING IN THEIR PROXIMITY. CONTRACTOR TO VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION. OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503)232-2987.
7. ALL GRADING SHALL BE IN CONFORMANCE WITH THE CURRENT CITY STANDARDS AND SPECIFICATIONS AND CURRENT GRADING ORDINANCE. ALL SUBGRADE MATERIAL SHALL BE CONSIDERED CLASS A AND COMPACTED TO 95% OF OPTIMUM DENSITY. AS SPECIFIED IN THESE PLANS, ALL FILL MATERIAL SHALL BE COMPACTED TO 95% RELATIVE COMPACTION PER THE CITY STANDARDS. TESTING TO BE REQUIRED IF REQUESTED BY THE OWNER OR EOR.
8. ALL FINAL CUT SLOPES SHALL NOT EXCEED A GRADE OF 2 TO 1 VERTICAL UNLESS OTHERWISE APPROVED. FILL SLOPES SHALL NOT EXCEED A GRADE OF 2 HORIZONTAL TO 1 VERTICAL UNLESS OTHERWISE APPROVED BY THE ENGINEER.
9. ALL UNSUITABLE SOILS MATERIALS, RUBBISH AND DEBRIS RESULTING FROM GRADING OPERATIONS SHALL BE REMOVED FROM THE JOB SITE AND DISPOSED OF PROPERLY.
10. THE CONTRACTOR SHALL EMPLOY ALL LABOR, EQUIPMENT, AND METHODS REQUIRED TO PREVENT DUST IN AMOUNTS DAMAGING TO PROPERTY, CULTIVATED VEGETATION AND DOMESTIC ANIMALS OR CAUSING A NUISANCE TO PERSONS OCCUPYING BUILDINGS IN THE VICINITY OF THE JOB SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY DUST RESULTING FROM CONSTRUCTION.
11. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE INDUSTRIAL SAFETY REGULATIONS. THE CITY AND DESCHUTES COUNTY AND THEIR OFFICIALS, THE ENGINEER, AND THE OWNER SHALL NOT BE RESPONSIBLE FOR ENFORCING SAFETY REGULATIONS.
12. MATERIAL QUANTITIES USED, NOTED, OR PROVIDED IN A SEPARATE ITEMIZED QUANTITY TAKE-OFF ARE AN ENGINEER'S OPINION OF PROBABLE MATERIAL REQUIREMENTS, AND IS AN ESTIMATE ONLY. CONTRACTOR'S HAVE THE SOLE RESPONSIBILITY OF MAKING THEIR OWN QUANTITY TAKE-OFF AND COST ESTIMATE.
13. ALL WORK SHALL BE PERFORMED BY A CITY APPROVED CONTRACTOR.
14. UTILITIES SHALL HAVE THE RIGHT TO INSTALL, MAINTAIN, AND OPERATE THEIR EQUIPMENT ABOVE AND BELOW GROUND AND ALL OTHER RELATED FACILITIES WITHIN THE PUBLIC UTILITY EASEMENTS (PUE) IDENTIFIED ON THIS PLAT MAP AS MAY BE NECESSARY OR DESIRABLE IN SERVING THE LOTS IDENTIFIED HEREIN, INCLUDING THE RIGHT OF ACCESS TO SUCH FACILITIES AND THE RIGHT TO REQUIRE THE REMOVAL OF ANY OBSTRUCTIONS INCLUDING TREES AND VEGETATION THAT MAY BE PLACED WITH IN THE PUE AT THE LOT OWNERS EXPENSE. AT NO TIME MAY ANY PERMANENT STRUCTURES BE PLACED WITHIN THE PUE OR ANY OTHER OBSTRUCTION WHICH INTERFERES WITH THE USE OF THE PUE WITHOUT PRIOR WRITTEN APPROVAL OF THE UTILITIES AND FACILITIES IN THE PUE.
15. CITY ENGINEER'S SIGNATURE DOES NOT CONSTITUTE APPROVAL OF FACILITIES PROPOSED ON PRIVATE PROPERTY. SEPARATE PERMITS ISSUED BY THE BUILDING DEPARTMENT ARE REQUIRED AND SHALL BE OBTAINED BY THE DEVELOPER FOR FACILITIES LOCATED OUTSIDE OF THE PUBLIC RIGHT-OF-WAY.
16. ANY WORK WITHIN EXISTING PUBLIC RIGHT-OF-WAY OR DEDICATED CITY EASEMENTS REQUIRES A SEPARATE RIGHT-OF-WAY EXCAVATION PERMIT OBTAINED FROM THE CITY ENGINEERING DIVISION.
17. ACCESS TO EXISTING PROPERTIES/RESIDENTS AFFECTED BY CONSTRUCTION ACTIVITIES WILL BE MAINTAINED AT ALL TIMES BY THE CONTRACTOR. EMERGENCY ACCESS AND COORDINATION OF BEND EMERGENCY SERVICES WILL BE REQUIRED.
18. SURVEY MONUMENTS, CONTROLS, OR PROPERTY CORNERS WHICH ARE DISTURBED OR DESTROYED BY CONSTRUCTION ACTIVITIES WILL BE RE-ESTABLISHED, RESTORED, AND/OR REPLACED AT THE CONTRACTOR'S EXPENSE.
19. ALL NECESSARY CHANGES TO DESIGN PLANS, REVEALED DURING CONSTRUCTION, MUST BE APPROVED BY THE DESIGN ENGINEER AND CITY OF LA PINE.



SITE MAP

SCALE: 1"=30'

SHEET INDEX:

SITE DATA

ADDRESS: 51487 HIGHWAY 97

PROPERTY AREA: 1.47 ACRES / 64,000 SF

ZONING: TRADITIONAL COMMERCIAL

EXISTING LAND USE: VACANT

PROPOSED LAND USE: TRANSIT CENTER

REGISTERED PROFESSIONAL ENGINEER 88857PE OREGON MARCH 11, 2014 APRIL KAYLEEN PUST
PRELIMINARY
RENEWS: DECEMBER 31, 2020

4TH ST TRANSIT CENTER
LA PINE, OR
COVER SHEET
DESCHUTES COUNTY, OREGON

LA PINE OREGON

REVISIONS:
1.
2.
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BECON CIVIL ENGINEERING & LAND SURVEYING
549 SW MILL VIEW WAY
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BEND, OREGON 97702
(541) 633-3140
www.beconeng.com

DESIGNED BY: AKP
DRAWN BY: CWA
SCALE: NTS
FILE: 13744-65
DATE: 9/18/2020

VERIFY SCALES
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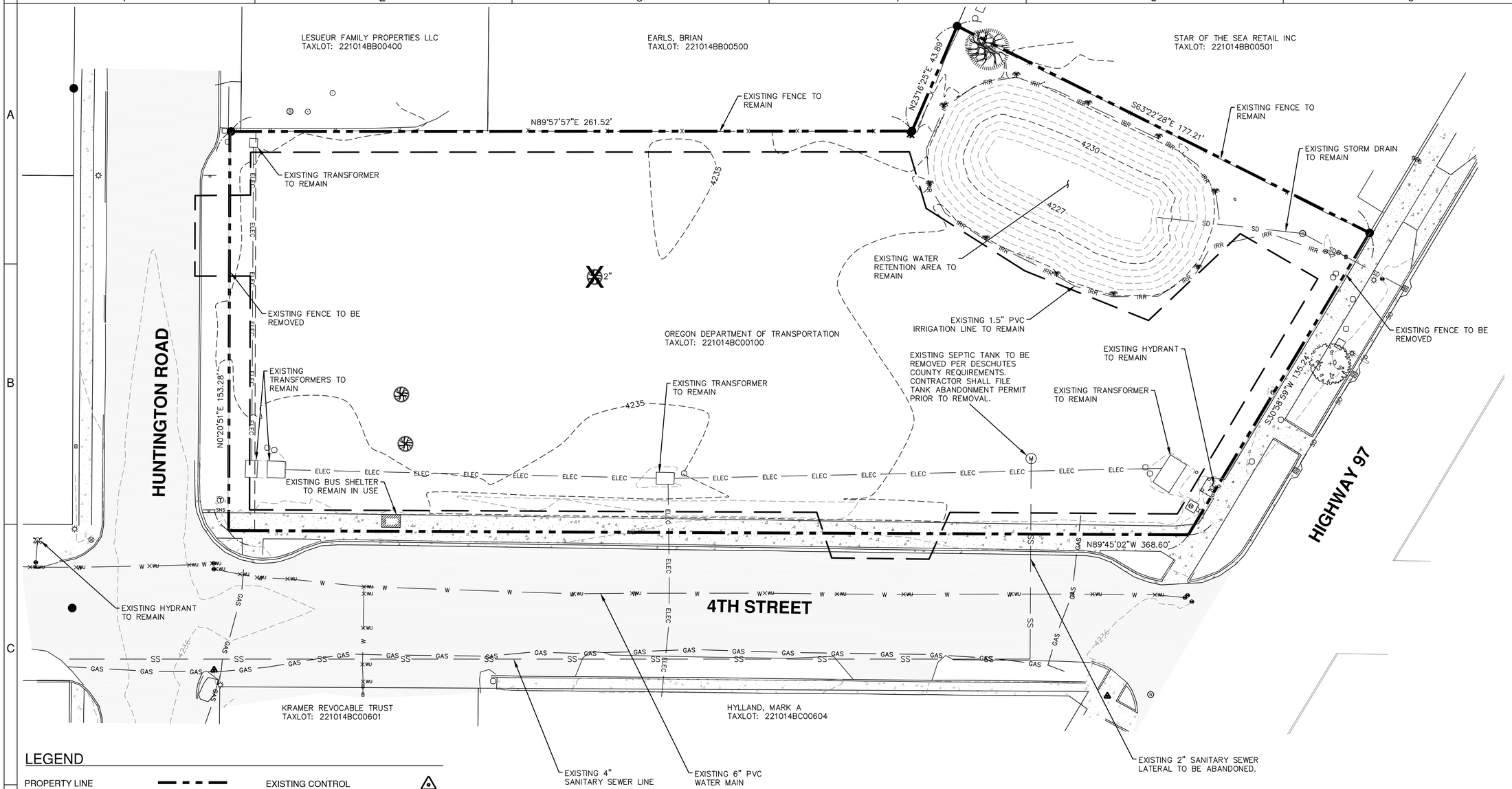
SHEET: C1.0

FILE# 13744-65



LEGEND

- PROPERTY LINE
- DEMOLITION BOUNDARY
- EXISTING TAX LOTS
- MAJOR CONTOURS (4200)
- MINOR CONTOURS (4201)
- EXISTING CURB
- EXISTING WATER (W)
- EXISTING STORM PIPE (SD)
- EXISTING SEWER (SS)
- EXISTING UNDERGROUND POWER (ELEC)
- EXISTING GAS (GAS)
- EXISTING LANDSCAPE IRRIGATION LINE (IRR)
- EXISTING CONCRETE
- EXISTING ASPHALT PAVEMENT

- EXISTING CONTROL
- EXISTING MONUMENT
- EXISTING HYDRANT
- EXISTING SEWER MANHOLE
- EXISTING SEWER CLEANOUT
- EXISTING WATER VALVE
- EXISTING WATER METER
- EXISTING CATCH BASIN
- EXISTING CATV/TEL PEDESTAL
- EXISTING LIGHT POLE
- EXISTING SIGN
- EXISTING IRRIGATION SPRINKLER
- EXISTING PINE TREE
- EXISTING TREE TO BE REMOVED WITH DBH SIZE

EXISTING CONDITIONS & DEMO PLAN

SCALE: 1"=20'

REGISTERED PROFESSIONAL ENGINEER
88857PE
OREGON
MARCH 11, 2014
AMY L. KAYLEEN PUST
PRELIMINARY
RENEWS: DECEMBER 31, 2020

4TH ST TRANSIT CENTER
LA PINE, OR

EXISTING CONDITIONS & DEMO PLAN

DESCHUTES COUNTY, OREGON

LA PINE OREGON

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2 OF 7

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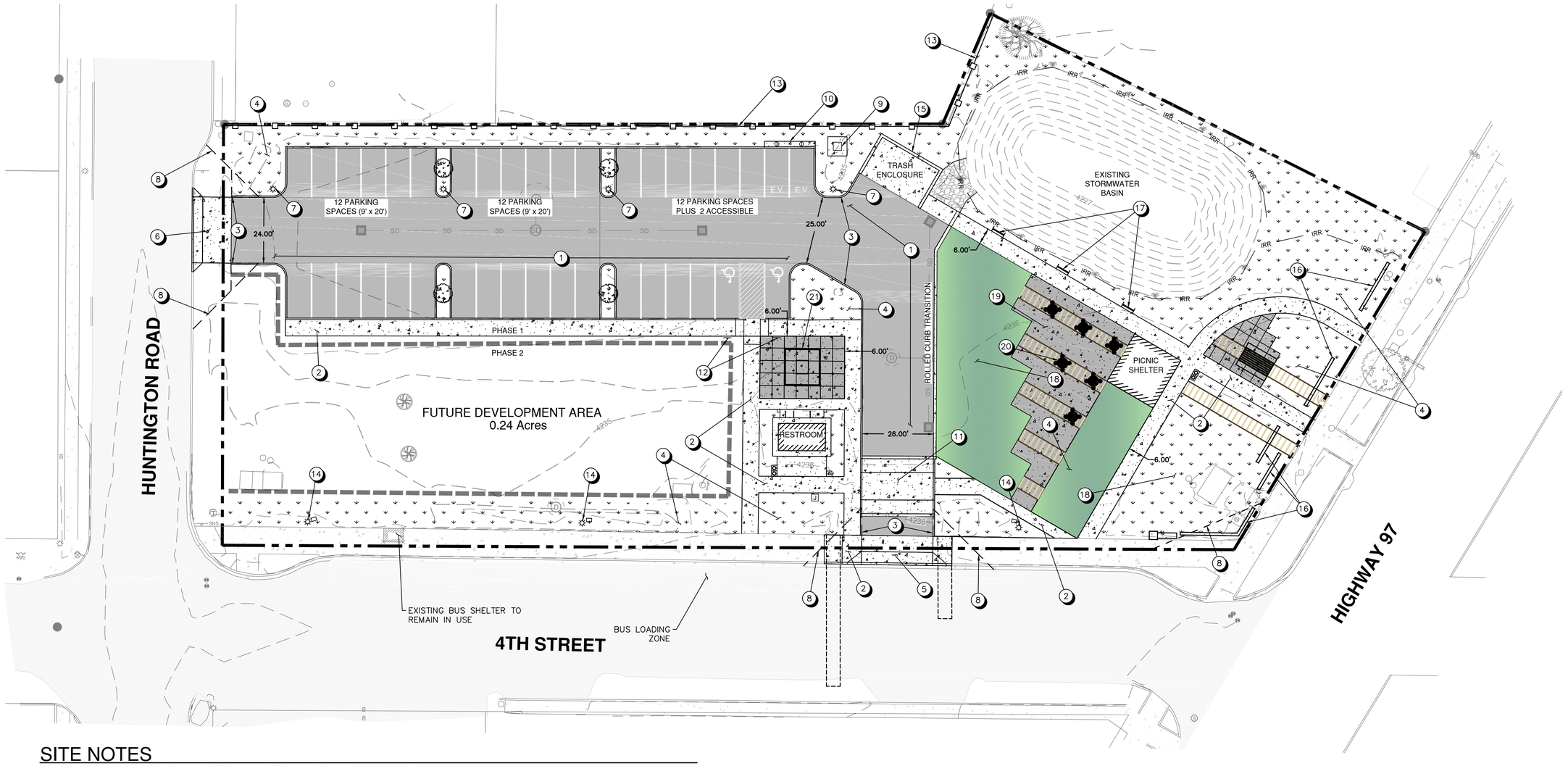

SITE NOTES

1. CONSTRUCT NEW 3" HMAC OVER 8" COMPACTED GRAVEL BASE FOR PARKING LOT
2. CONSTRUCT WALKWAY WITH 4" CONCRETE OVER 4" COMPACTED GRAVEL BASE PER ODOT STD DWG'S RD 720
3. CONSTRUCT STANDARD 12" CURB WITH 6" REVEAL PER ODOT STD DWG RD-700
4. PROPOSED LAWN AREA. REFER TO LANDSCAPING PLANS
5. PROPOSED DRIVEWAY TO BE INSTALLED PER ODOT STD DWG RD 745 OPTION K
6. PROPOSED DRIVEWAY TO BE INSTALLED PER ODOT STD DWG RD 740 OPTION H
7. PROPOSED LIGHT POLE
8. CLEAR VISION AREA
9. PROPOSED TRANSFORMER
10. PROPOSED ELECTRIC VEHICLE CHARGING STATIONS
11. PROPOSED RAISED CONCRETE PEDESTRIAN CROSSING. CONSTRUCT WITH 6" CONCRETE OVER 4" COMPACTED GRAVEL BASE
12. PROPOSED ADA SIGN
13. PROPOSED 6' CEDAR FENCE
14. PROPOSED ODOT STREET LIGHTS. SEE DETAIL 3 ON SHEET C6.0 FOR BASE DETAILS
15. PROPOSED CMU WALL SURROUNDING TRASH ENCLOSURE 6' IN HEIGHT.
16. PROPOSED CONCRETE SEAT WALL. REFER TO LANDSCAPING PLANS
17. PROPOSED PARK BENCH
18. PROPOSED XERISCAPE AREA. REFER TO LANDSCAPING PLANS.
19. PROPOSED CONCRETE AREA WITH 4" CONCRETE OVER 4" COMPACTED GRAVEL BASE.
20. FIXED PICNIC TABLES INSTALLED BY CITY.
21. RAISED PLANTER BOX. SEE SHEET H2.0.

LEGEND

PROPOSED CONCRETE	EXISTING PROPERTY LINE
EXISTING CONCRETE	PROPOSED BUILDING
PROPOSED ASPHALT	PROPOSED CURB
EXISTING ASPHALT	PROPOSED SAWCUT
PROPOSED LAWN AREA	CLEAR VISION AREA
PROPOSED LANDSCAPE AREA	PHASE 2 BOUNDARY
STAINED CONCRETE (RUSTIC BROWN)	PROPOSED FENCE
	PROPOSED LIGHT
	PROPOSED TREE

N

SITE PLAN
SCALE: 1"=20'

REGISTERED PROFESSIONAL ENGINEER
88857PE
OREGON
MARCH 11, 2014
AMY K. PUST
PRELIMINARY
RENEWS: DECEMBER 31, 2020

4TH ST TRANSIT CENTER
LA PINE, OR

SITE PLAN

DESCHUTES COUNTY, OREGON

LA PINE OREGON

REVISIONS:
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SHEET: C3.0

3 OF 7

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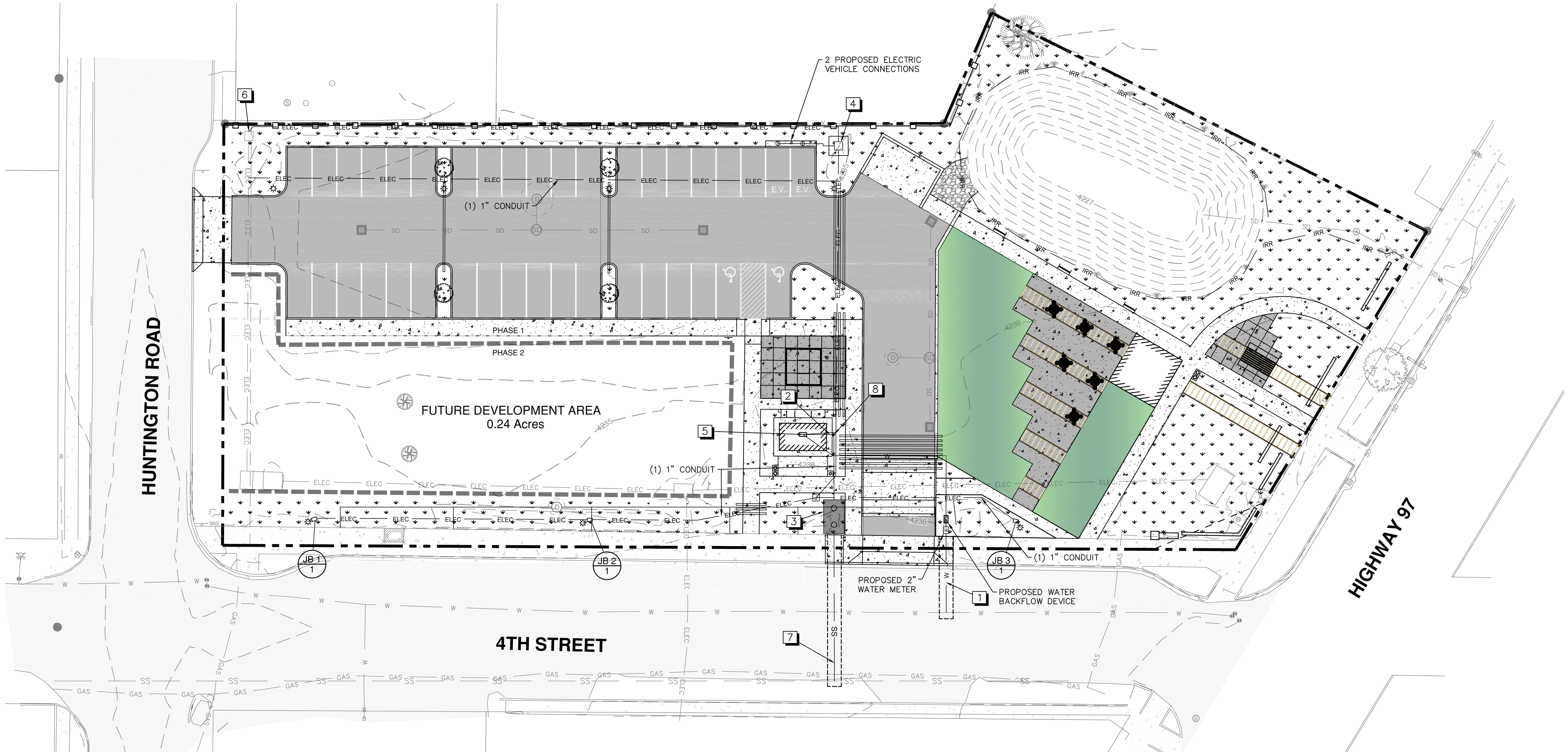

UTILITY NOTES

1. INSTALL 2" WATER SERVICE, HOT TAP PER CITY OF LA PINE STANDARDS
2. INSTALL 4" PVC SEWER LINE FROM RESTROOMS. SLOPE PIPE AT MINIMUM 2%
3. 3000 GALLON CONCRETE SEPTIC TANK WITH DECORATIVE LIDS
4. PROPOSED POWER TRANSFORMER
5. 16" x 32" PLUMBING BLOCKOUT FOR BATHROOMS
6. ELECTRICAL SERVICE TO BE TIED INTO EXISTING ELECTRICAL TRANSFORMER
7. 4" PVC SANITARY SEWER EFFLUENT LINE TO RUN FROM SEPTIC TANK TO SEWER MAIN
8. INSTALL CLEANOUT AND 90° FITTING

JUNCTION BOXES WILL BE LOCATED AT EACH ODOT STREET LIGHT AND ALL STREET LIGHTS WILL BE CONNECTED BY 1" CONDUIT

JB X / 1 — INSTALL 17"X10"X12" (MIN. DIMENSION) PRECAST CONCRETE JUNCTION BOX W/ METAL LID PER ODOT STANDARD DETAIL TM472 LOCATED ON SHEET 6.0

AT STANDARD LIGHT POLE, PERFORM SWEEP UP OF LINE FOR INSTALLATION.

LEGEND

- PROPOSED CONCRETE
- EXISTING CONCRETE
- PROPOSED ASPHALT
- EXISTING ASPHALT
- PROPOSED LAWN AREA 🟩
- PROPOSED LIGHT ☼
- PROPOSED WATER METER W
- PROPOSED WATER BACKFLOW DEVICE BFD
- PROPOSED ELECTRIC JUNCTION J
- EXISTING PROPERTY LINE
- PROPOSED BUILDING
- PROPOSED CURB
- PROPOSED SAWCUT
- PHASE I AND II BOUNDARY
- PROPOSED SANITARY SEWER — SS —
- PROPOSED ELECTRICAL LINE — ELEC — ELEC —
- PROPOSED STORM DRAIN — SD — SD —
- PROPOSED WATER LINE — W —
- PROPOSED CONDUIT SLEEVE

N

UTILITY PLAN

SCALE: 1"=20'

REGISTERED PROFESSIONAL ENGINEER
88857PE
OREGON
MARCH 11, 2014
APRIL KAYLEEN PUST
PRELIMINARY
RENEWS: DECEMBER 31, 2020

4TH ST TRANSIT CENTER
LA PINE, OR
UTILITY PLAN
DESCHUTES COUNTY, OREGON

LA PINE
OREGON

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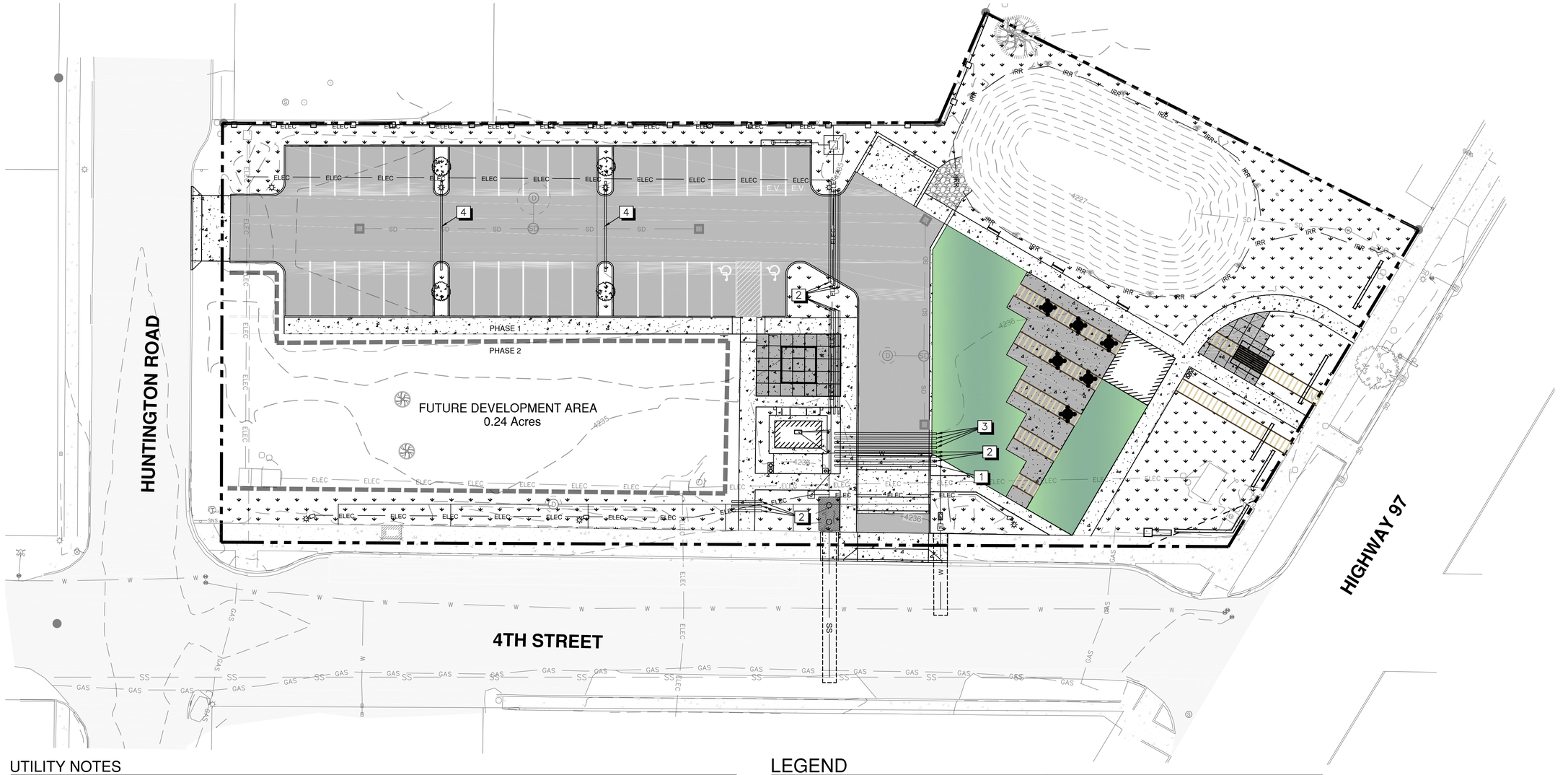

UTILITY NOTES

1. INSTALL 8" CONDUIT SLEEVE WITH 4' COVER.
2. INSTALL 4" CONDUIT SLEEVE WITH MIN. 1' COVER.
3. INSTALL 3" CONDUIT SLEEVE WITH MIN. 1' COVER.
4. INSTALL 2" CONDUIT SLEEVE WITH MIN. 1'COVER.

INSTALL TRACER WIRE IN EACH SLEEVE

INSTALL CLEAN-OUT OR BOX AT EACH END OF EVERY SLEEVE

LEGEND

PROPOSED CONCRETE		EXISTING PROPERTY LINE	
EXISTING CONCRETE		PROPOSED BUILDING	
PROPOSED ASPHALT		PROPOSED CURB	
EXISTING ASPHALT		PROPOSED SAWCUT	
PROPOSED LAWN AREA		PHASE I AND II BOUNDARY	
PROPOSED LIGHT	☼	PROPOSED SANITARY SEWER	SS
PROPOSED WATER METER	W	PROPOSED ELECTRICAL LINE	ELEC
PROPOSED WATER BACKFLOW DEVICE	BFD	PROPOSED STORM DRAIN	SD
PROPOSED ELECTRIC JUNCTION	J	PROPOSED WATER LINE	W
		PROPOSED CONDUIT SLEEVE	

N

SLEEVE PLAN

SCALE: 1"=20'

REGISTERED PROFESSIONAL ENGINEER
88857PE
OREGON
MARCH 11, 2014
M. KAYLEEN PUST
RENEWS: DECEMBER 31, 2020
PRELIMINARY

4TH ST TRANSIT CENTER
LA PINE, OR
SLEEVE PLAN
DESCHUTES COUNTY, OREGON

LA PINE OREGON

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5 OF 7

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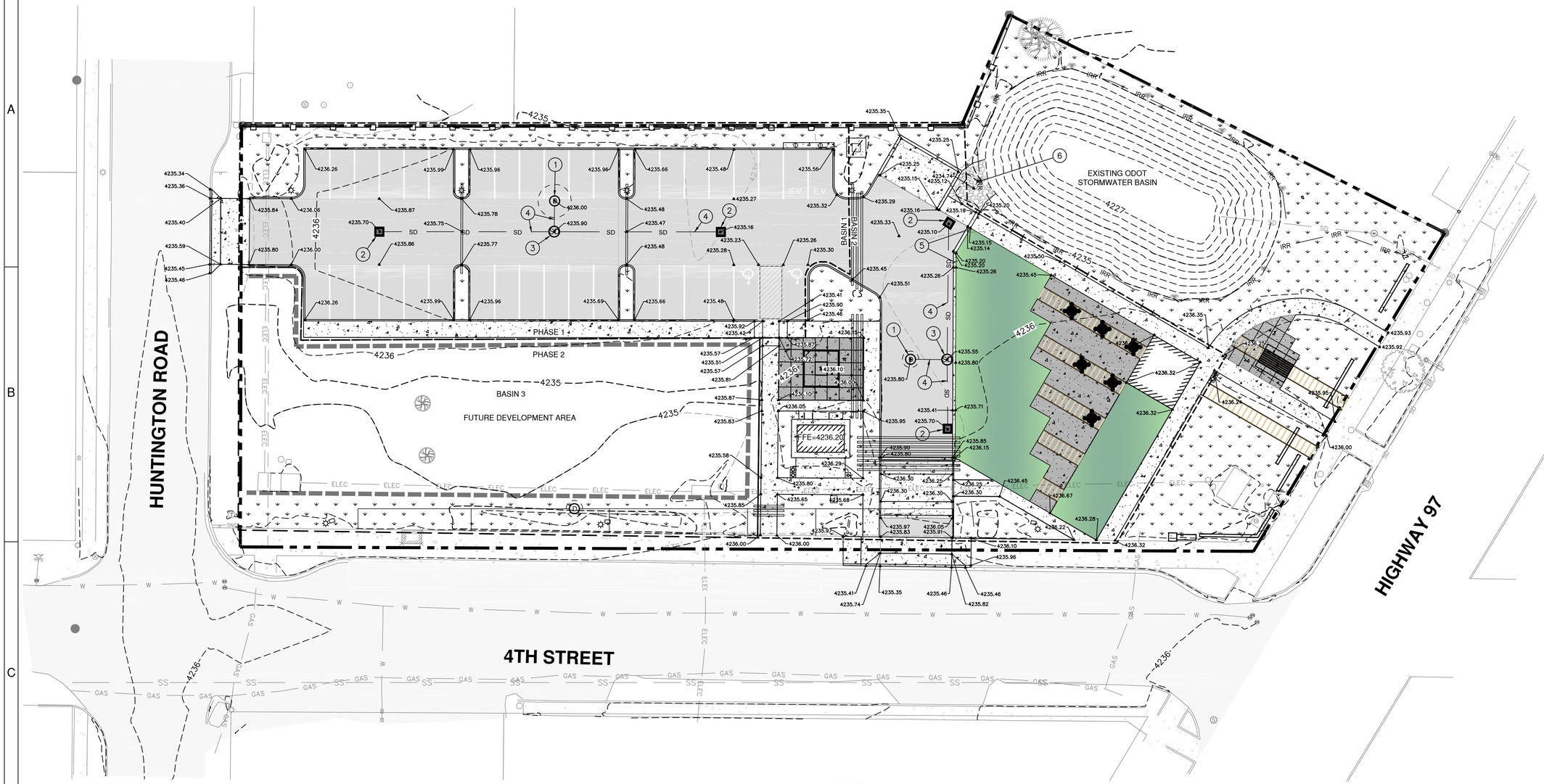

GRADING & DRAINAGE NOTES

1. INSTALL PRE-CAST TYPE II DRYWELL PER DETAIL 1 ON SHEET C6.0
2. INSTALL STANDARD TYPE "3" CATCH BASIN PER ODOT STD DWG RD 378
3. INSTALL PRE-CAST STORMWATER SEDIMENTATION MANHOLE PER DETAIL 2 ON SHEET C6.0
4. INSTALL 8" PVC STORM PIPE. PIPE TO SLOPE AT A MIN. OF 2% SLOPE
5. ROLLED CURB TO TRANSITION TO FLUSH WITH ASPHALT BETWEEN DRIVEWAY AND XERISCAPE AREA
6. DRAINAGE ROCK INTO SWALE FOR SNOW REMOVAL AND EROSION PREVENTION. USE MINIMUM SIZE OF 4" GRAVEL AGGREGATE IN CONSTRUCTING DRAINAGE

STORMWATER CALCULATIONS

6 MONTH = 1.0" / 25 YEAR = 2.5" / 100 YEAR = 3.0"

BASIN	IMPERVIOUS AREA (SF/AC) CN=98	25 YR STORM PEAK FLOW (CFS/GPM)	25 YR STORM VOLUME (CF/GAL)
1	11,737/0.27	0.69/309.67	2,082/15,573
2	8,345/0.19	0.49/287.23	1,480/11,070
3	16,437/0.38	0.49/287.23	1,480/11,070

NOTE:
STORMWATER SYSTEM, INFILTRATION, AND TESTING TO BE DESIGNED PER CITY OF LA PINE AND COSM DESIGN STANDARDS FOR CITY OF LA PINE BUILDING PERMIT.

LEGEND

- EXISTING PROPERTY LINE
- PROPOSED MINOR CONTOUR 3581
- PROPOSED MAJOR CONTOUR 3580
- EXISTING MINOR CONTOUR 3581
- EXISTING MAJOR CONTOUR 3580
- PROPOSED STORM PIPE SD
- EXISTING STORM PIPE SD
- DRAINAGE BASIN
- PROPOSED CATCH BASIN
- PROPOSED SEDIMENT MANHOLE SD
- PROPOSED DRYWELL D
- PROPOSED FINISH GRADE ELEVATION 4235.00

GRADING & DRAINAGE PLAN

SCALE: 1"=20'

REGISTERED PROFESSIONAL ENGINEER
88857PE
OREGON
MARCH 11, 2014
AKAYLEEN PUST
PRELIMINARY
RENEWS: DECEMBER 31, 2020

4TH ST TRANSIT CENTER
LA PINE, OR

GRADING & DRAINAGE PLAN

DESCHUTES COUNTY, OREGON

LA PINE OREGON

REVISIONS:
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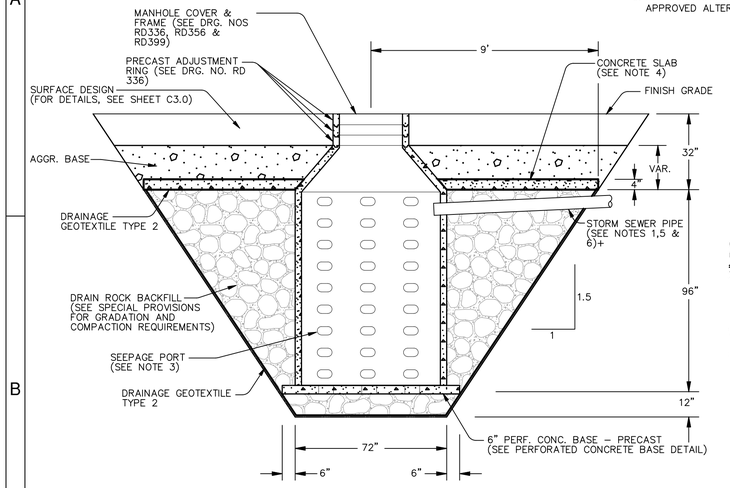
SHEET: C5.0

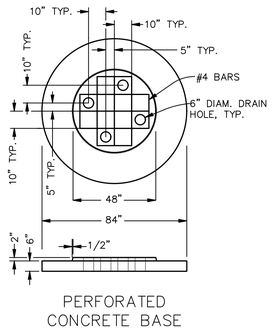
6 OF 7

FILE# 13744-65

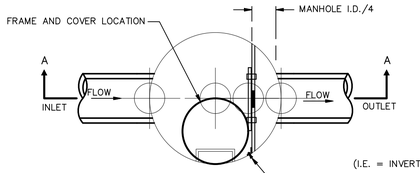
GENERAL NOTES FOR ALL DETAILS:
1. FOR STORM SEWER PIPE MATERIALS, SIZES, SLOPES & LOCATIONS, SEE PLAN SHEETS AND PIPE DATA SHEETS.
2. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OF ASTM C478.
3. SEEPAGE PORT SIZE AND LOCATION VARY BY MANUFACTURER.4. CONSTRUCT PRECAST OR CAST-IN-PLACE CONCRETE SLAB.5. CONNECT INLET PIPE TO STRUCTURE USING PRECAST HOLE OR CORE DRILLED HOLE.
6. ALL CONNECTING PIPES SHALL HAVE A TRACER WIRE, OR APPROVED ALTERNATE.



DRYWELL – TYPE II

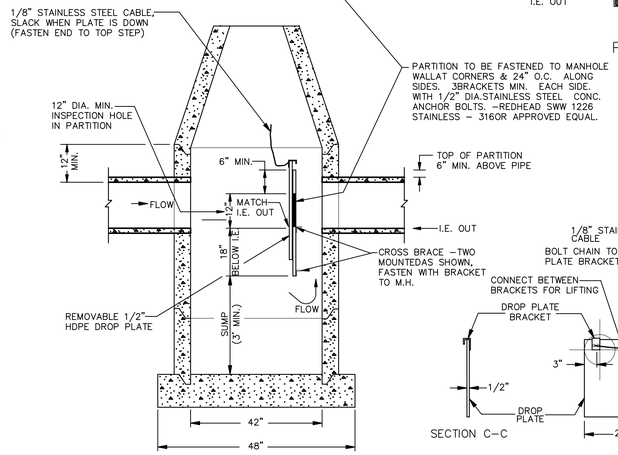


PERFORATED CONCRETE BASE

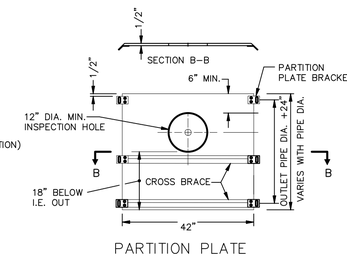


PLAN

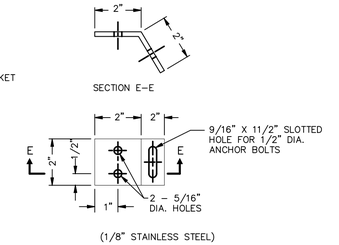
(I.E. = INVERT ELEVATION)



SECTION A–A



PARTITION PLATE

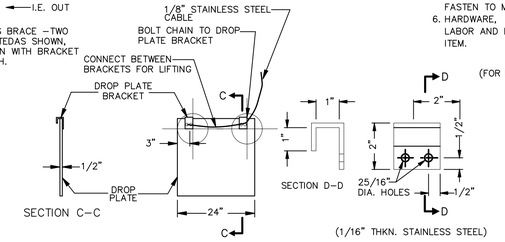


(1/8" STAINLESS STEEL)

PARTITION PLATE BRACKET

GENERAL NOTES FOR ALL DETAILS:
1. HARDWARE, FASTENERS AND ANCHORS TO BE STAINLESS STEEL; USE 1/8" STAINLESS STEEL CABLE.
2. SEE PIPE DATA SHEET AND PLAN SHEETS FOR PIPE SIZE(S).
3. REMOVABLE DROP PLATE AND PARTITION TO BE CONSTRUCTED OF HIGH DENSITY POLYETHELENE (HDPE), 1/2" THICK ASTM D1248–78 AND INSTALLED PRIOR TO MANHOLE CONE OR TOP.
4. MANHOLE AND BASE PER MANHOLE STANDARD DRAWINGS.
5. CROSS BRACE L 21/2" X 11/2" X 3/16" HOT–DIP GALVANIZE, ASTM A–123. TWO PER PARTITION PLATE – FULL WIDTH. FASTEN TO PARTITION WITH STAINLESS BOLT, NUT & WASHER AT 18" CTRS. FASTEN TO M.H. AT ENDS USING PARTITION PLATE BRACKETS.
6. HARDWARE, FASTENERS, ANCHORS, FITTINGS, APPURTENANCES, LABOR AND EQUIPMENT IS INCIDENTAL TO SEDIMENTATION MANHOLE ITEM.

(FOR DETAILS NOT SHOWN, SEE DRG. NOS. RD340 & RD346)



SECTION C–C

DROP PLATE

(1/16" THKN. STAINLESS STEEL)

DROP PLATE BRACKET

TYPE II DRYWELL DETAIL

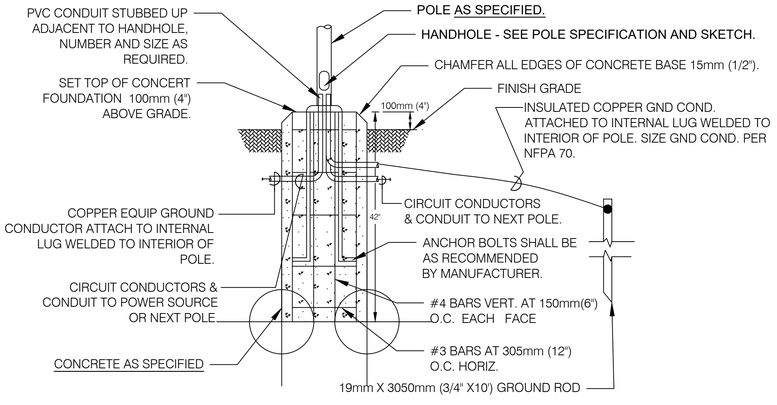
N.T.S.

1 / C6.0

SEDIMENTATION MANHOLE DETAIL

N.T.S.

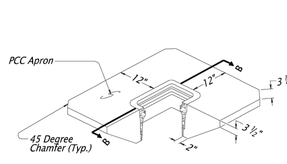
2 / C6.0



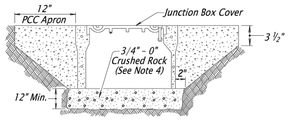
ILLUMINATION POLE BASE DETAIL

N.T.S.

3 / C6.0

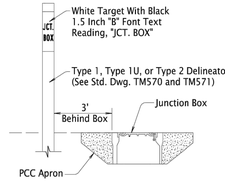


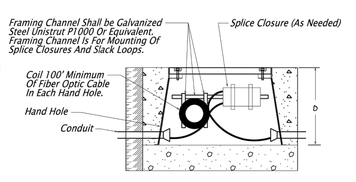
SECTION B–B



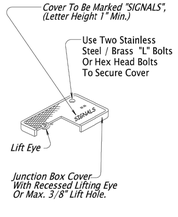
INSTALLATION IN UNSURFACED AREA

(This Detail Only Applicable for Junction Boxes Located In Incidental Travel Areas; Gravel Shoulders, Behind Guardrail, Etc. Do Not Install In Travel Lanes, Paved Shoulders, Or Other Areas Exposed To Traffic.)

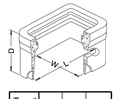




HAND HOLE INSTALLATION



JUNCTION BOX COVER DETAILS



Type*	L	W	D
JB1	17"	10"	12"
JB2	22"	12"	12"
JB3	30"	17"	12"
HH-1	24"	30"	24"
HH-2	30"	48"	24"
HH-3	30"	48"	36"

*Junction Box Or Handhole Type As Shown On Plans

DIMENSION TABLE

GENERAL NOTES:

1. Install Top of Junction Box Flush With The Sidewalk, Surrounding Grade, Or Top Of Curb
2. Install Junction Boxes At The Approximate Locations Shown, Or If Not Shown, No More Than 300 Feet Apart
3. More Junction Boxes Than Specified May Be Installed To Facilitate The Work At The Option And Cost Of The Contractor
4. Use Materials According To 00640.10 and 00640.16. Use Compaction Equipment Suitable For Area And Compact Each Six Inch Layer With Sufficient Coverages To Produce A Firm Unyielding Surface.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

CALC. BOOK NO.: N/A

BASELINE REPORT DATE: 2-Jan-2020

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

TRAFFIC SIGNAL JUNCTION BOXES/ HAND HOLES

2018

DATE	REVISION DESCRIPTION
07/18	Added A New Detail & Notes, Revised & Simplified Details
01/20	Added General Note 4

ODOT LIGHT POST JUNCTION BOX

N.T.S.

4 / C4.1

PRELIMINARY
REGISTERED PROFESSIONAL ENGINEER
88857PE
OREGON
MARCH 11, 2014
KAYLEEN PUST
RENEWS: DECEMBER 31, 2020

4TH ST TRANSIT CENTER
LA PINE, OR

DETAILS SHEET

DESCHUTES COUNTY, OREGON

LA PINE OREGON

REVISIONS:
1.
2.
3.

BECON
CIVIL ENGINEERING & LAND SURVEYING
549 SW MILL VIEW WAY SUITE 105 BEND, OREGON 97702 (541) 633-3140 www.beconeng.com

DESIGNED BY: AKP
DRAWN BY: CWA
SCALE: NTS
FILE: 13744-65
DATE: 9/18/2020

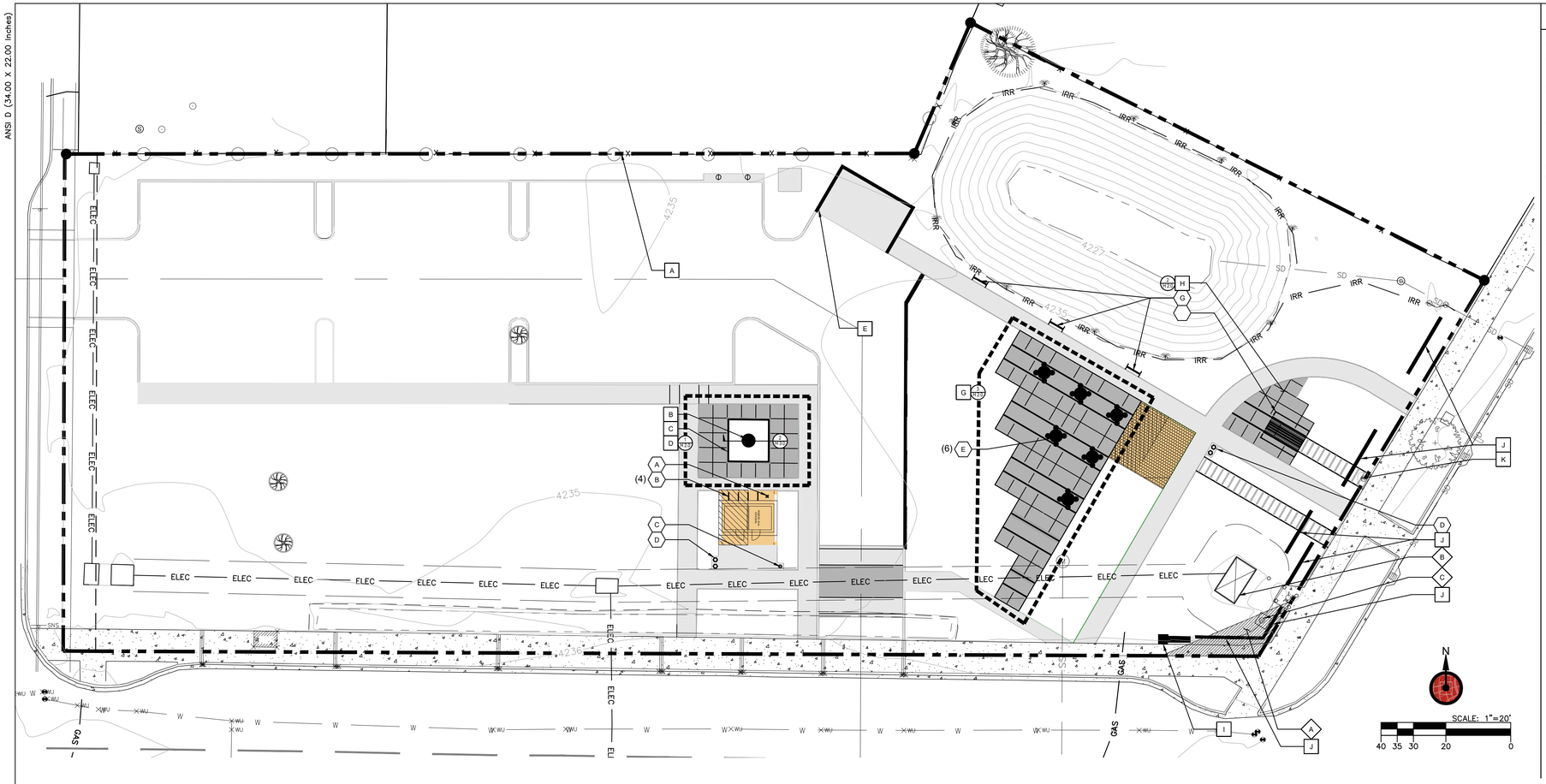
VERIFY SCALES
0 1"
BAR EQUALS ONE INCH ON ORIGINAL DRAWING

SHEET: C6.0

7 OF 7

FILE# 13744-65

ANSI D (34.00 X 22.00 Inches)



GENERAL NOTES

1. CONTRACTOR SHALL OBTAIN SITE SIGN PERMIT FROM CITY OF LA PINE.
2. CONTRACTOR SHALL PROVIDE STRUCTURALLY ENGINEERED SHOP DRAWINGS FOR ALL SIGNAGE AND WALL STRUCTURAL ELEMENTS, INCLUDING, BUT NOT LIMITED TO, CONCRETE FOOTINGS, STEEL REINFORCING AND FASTENER SIZING.
3. UTILITIES ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING UTILITIES. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
4. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING ROADWAYS, WALKS, CURB AND GUTTERS, UTILITIES AND VEGETATION. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
5. ELECTRICAL ENGINEERING AND ROUTING SHALL BE DESIGN-BUILT BY CONTRACTOR
6. CONTRACTOR SHALL VISIT THE SITE TO INSPECT AND VERIFY THE EXTENT OF DEMOLITION, EXISTING CONNECTION POINTS FOR ELECTRICAL POWER, AND EXISTING SITE CONDITIONS.
7. CONTRACTOR SHALL FIELD STAKE ALL SITE IMPROVEMENTS AND RECEIVE OWNER OR LANDSCAPE ARCHITECT APPROVAL OF STAKED LOCATION PRIOR TO START OF INSTALLATION.
8. ALL DIMENSIONS SHALL BE FIELD VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION. ANY DEVIATION FROM DRAWINGS MUST BE APPROVED BY OWNER OR LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.

AMENITY SCHEDULE

KEY	QTY	ITEM	SPECIFICATION	DETAIL
A	1	BIKE FIX-IT STATION	DERO FIX-IT STATION AND AIR KIT, PHONE:(888) 337-6729	
B	4	BIKE RACK	INVERTED U, POWDER COATED BROWN	3/H 3.0
C	1	DRINKING FOUNTAIN	MOST DEPENDABLE FOUNTAINS, MODEL 440 SMSS, BROWN, PHONE: 901-867-0039	
D	2	TRASH RECEPTACLE	TO BE INSTALLED BY OTHERS	
E	6	PICNIC TABLE	TO BE INSTALLED BY OTHERS	
F				
G	3	AXLE SEAT	TO BE RESTORED BY OTHERS	
H	1			

HARDSCAPE KEY

KEY	ITEM	DETAIL
A	FENCE	1/H 3.0
B	ART PLINTH IN RAISED PLANTER	2/H 3.0
C	CONCRETE SEAT WALL	2/H 3.0
D	PAVING AREA A	1/H 2.0
E	TRASH ENCLOSURE	4/H 3.0
F		3/H 2.0
G	PAVING AREA C	3/H 2.0
H	PAVING AREA D	2/H 2.0
I	SITE SIGNAGE	7/H 3.0
J	SITE WALL	6/H 3.0
K	RAIL AND TIES IN SOFTSCAPE	5/H 3.0

NOTES

KEY	
A	CLEAR VISION AREA
B	EXISTING POWER VAULT - MAINTAIN 10' CLEAR ZONE WITH ALL VERTICAL ELEMENTS
C	EXISTING IRRIGATION CABINET - REMOVE EXISTING IRRIGATION PEDESTAL AND AFFIX IRRIGATION CABINET ON BACK OF SITE WALL

PRELIMINARY

LOCI studio
541.241.6134 WWW.LOCI.STUDIO

LA PINE SENIOR CENTER

HARDSCAPE AND AMENITIES PLAN

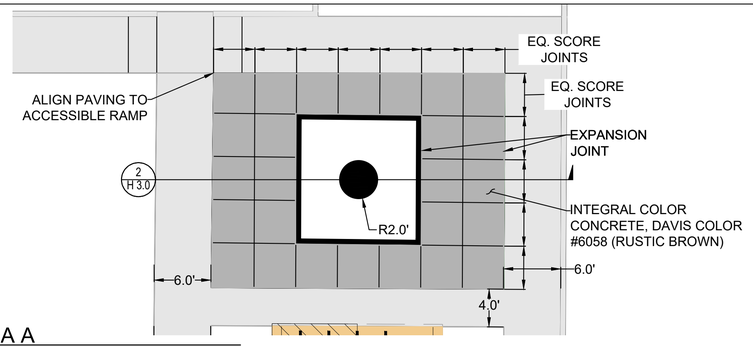
REVISION DESCRIPTION	#	DATE

PLOT DATE: 7/14/20
DRAWN BY: CJS
CHECKED BY:

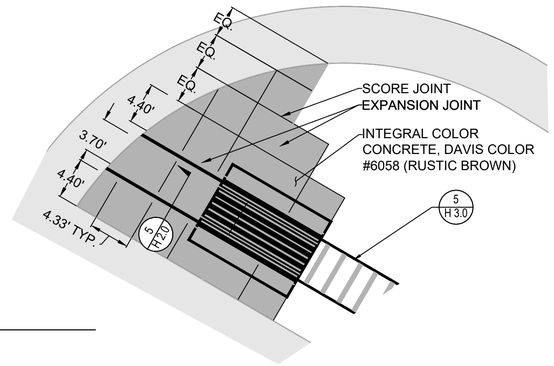
HARDSCAPE PLAN

H 1.0

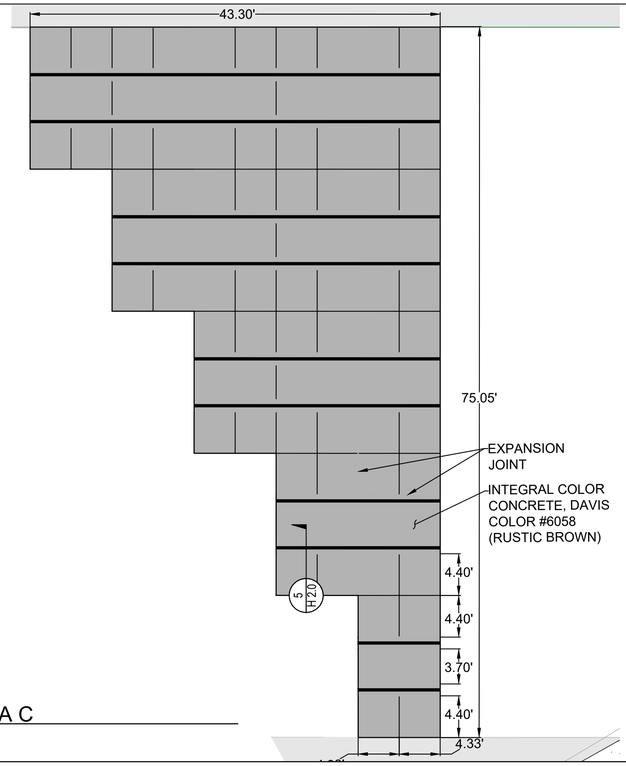
lgcn_02_sp01.dwg



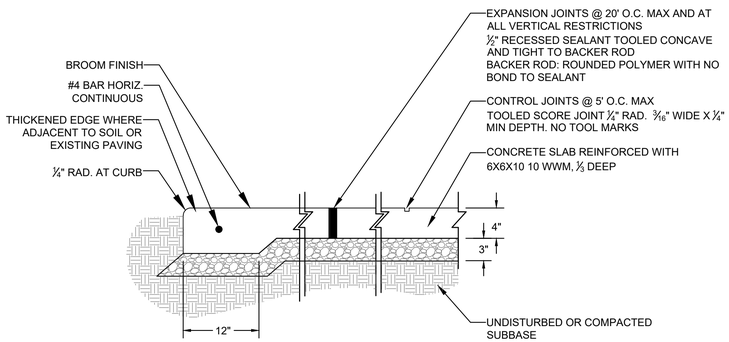
1 H 2.0 PAVING AREA A



2 H 2.0 PAVING AREA D

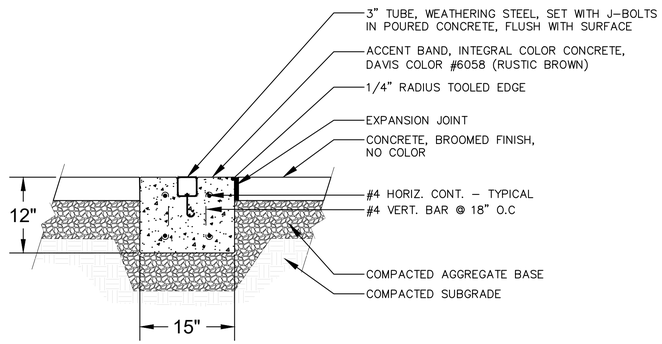


3 H 2.0 PAVING AREA C



NOTES:
1. PROVIDE EXPANSION JOINT AS INDICATED
2. PROVIDE 1 1/2" MIN. DEEP TOOLED SCORE JOINT @ AS INDICATED 4' O.C. MAX. SCORE JOINT TO HAVE 1/4" RADIUS TOOLED EDGE

4 H 2.0 CONCRETE JOINTS



5 H 2.0 ACCENT BAND IN CONCRETE

PRELIMINARY

LOCI studio
541.241.6134 WWW.LOCI.STUDIO

LA PINE STATION

HARDSCAPE DETAIL PLANS

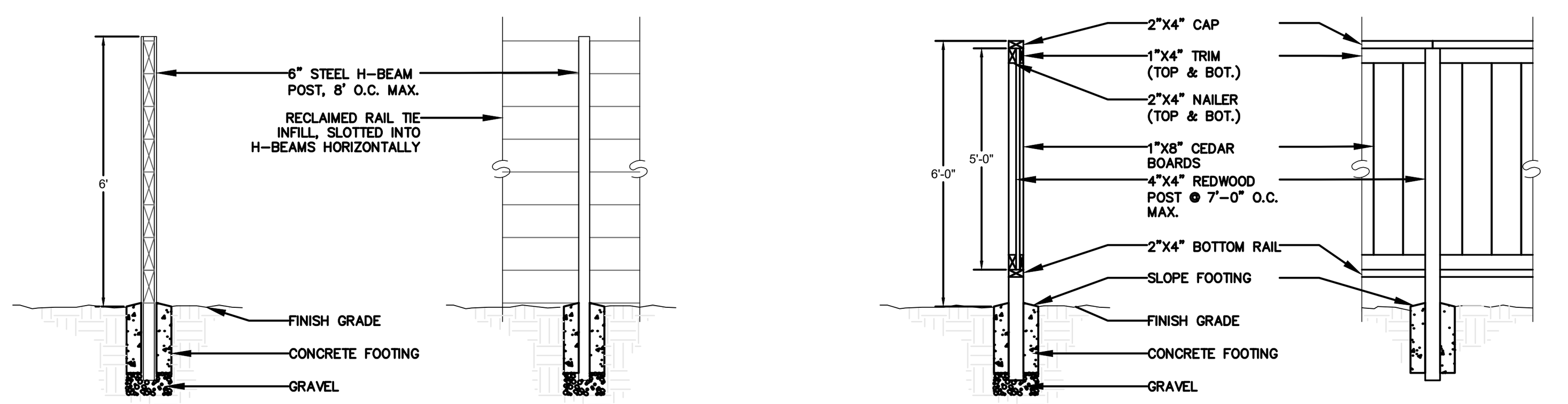
REVISION DESCRIPTION	#	DATE

PLOT DATE: 7/14/20
DRAWN BY: CJS
CHECKED BY:

HARDSCAPE DETAILS

H 2.0

ANSI D (34.00 X 22.00 Inches)

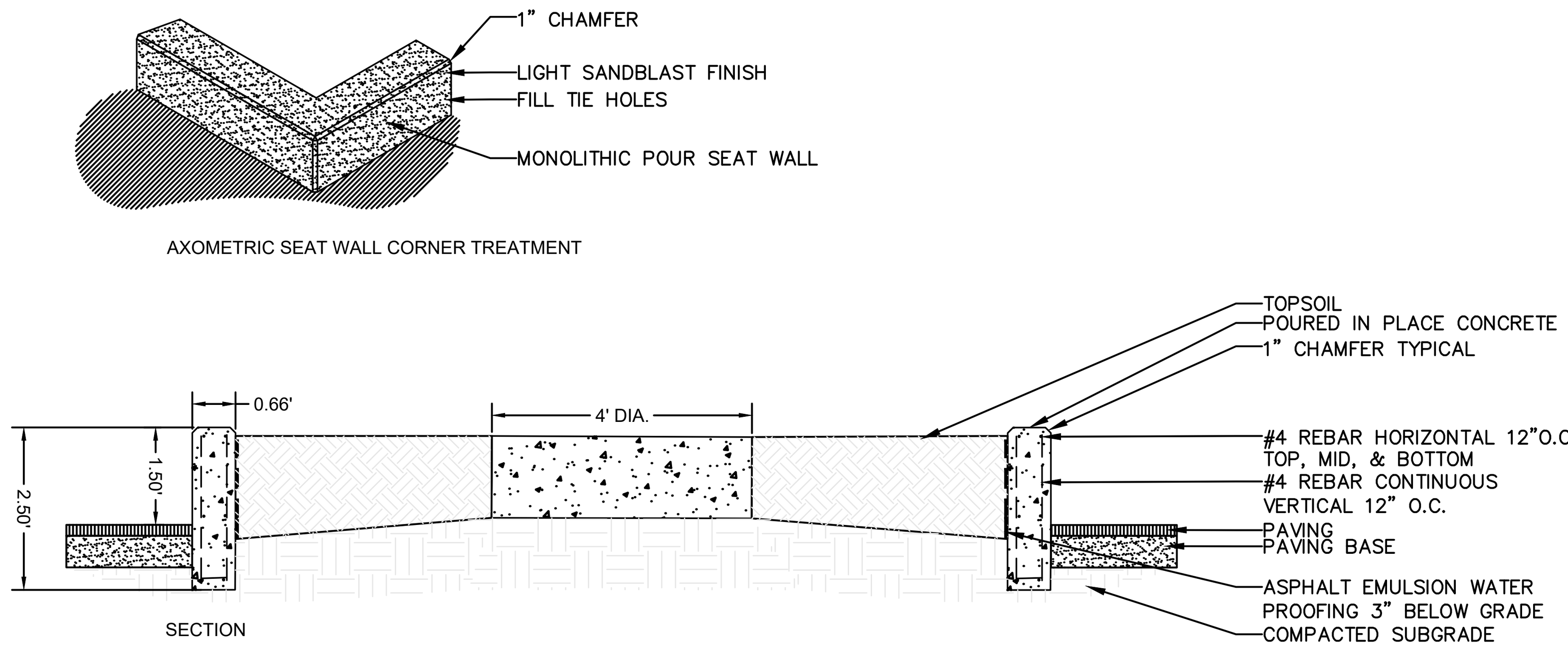


NOTES:
1. STAIN FENCE TO MATCH SITE SIGN
2. WOOD TO BE CEDAR, ROUGH SAWN, SELECT CONSTRUCTION, UNLESS OTHERWISE NOTED.

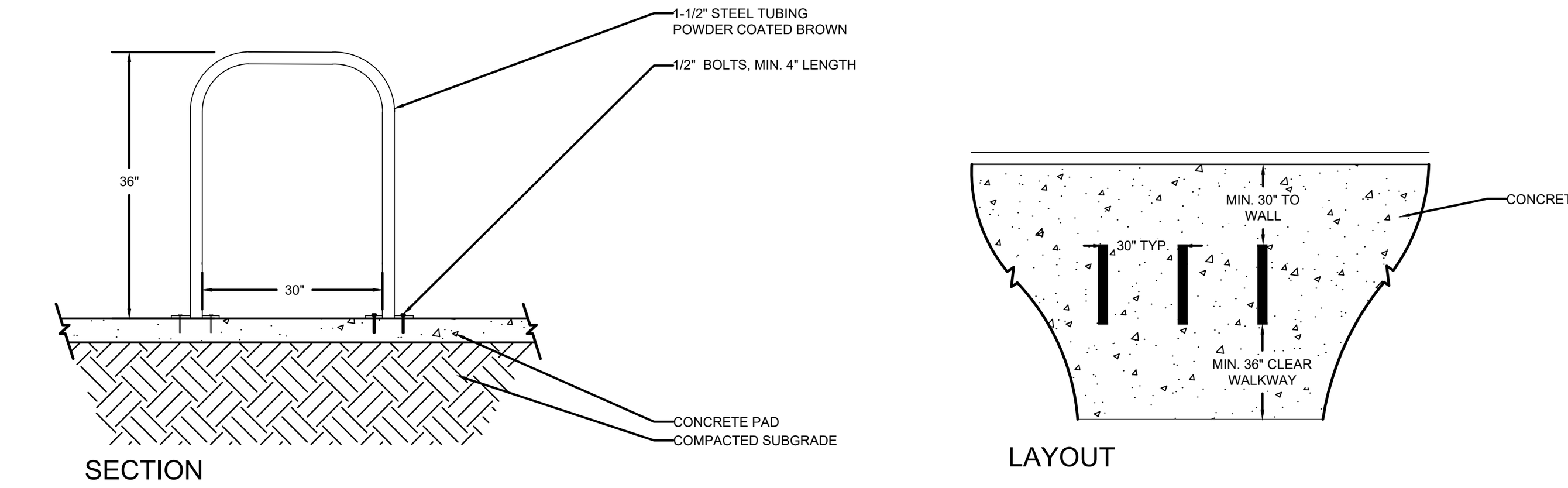
ALTERNATE A - RAIL TIE FENCE

ALTERNATE B - CEDAR VERTICAL BOARD FENCE

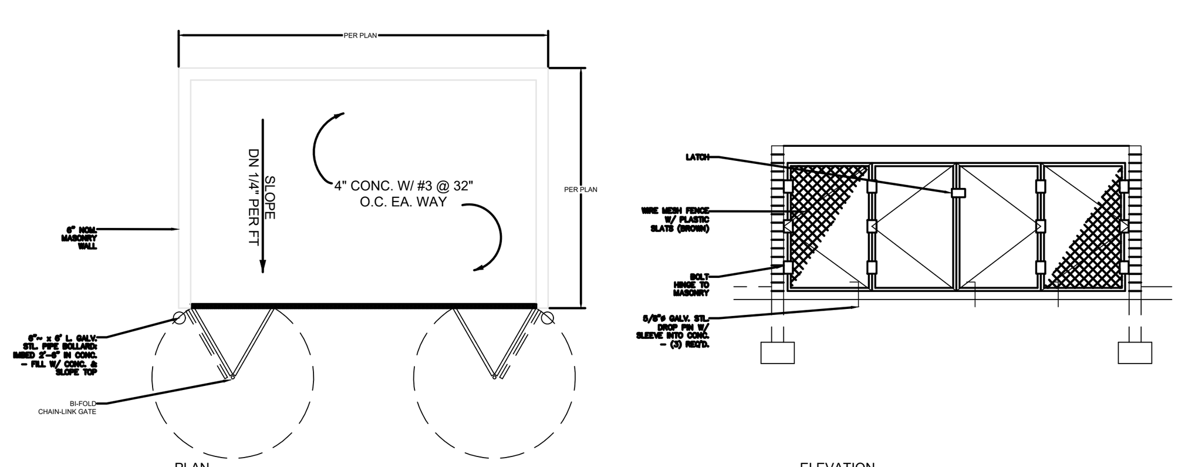
1 H 3.0 FENCE



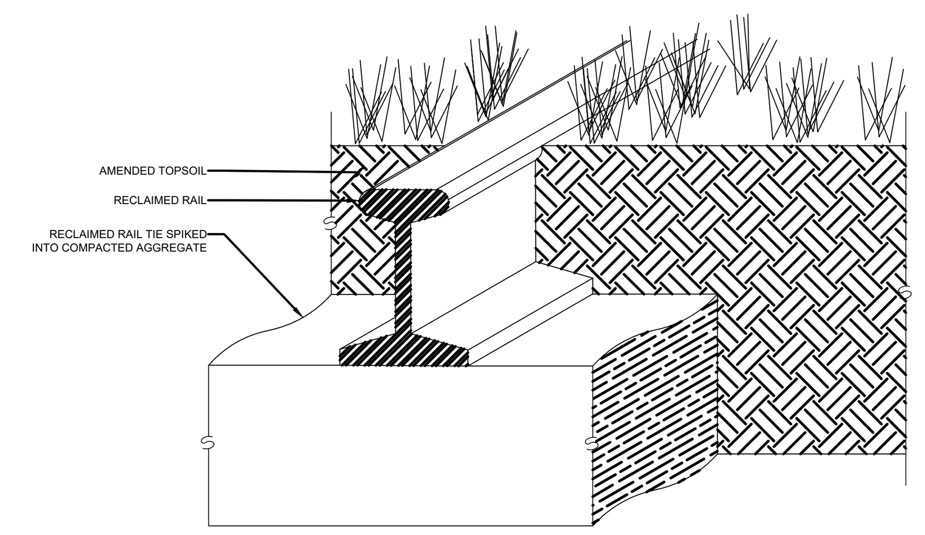
2 H 3.0 ART PLINTH AND PLANTER WITH SEAT WALL



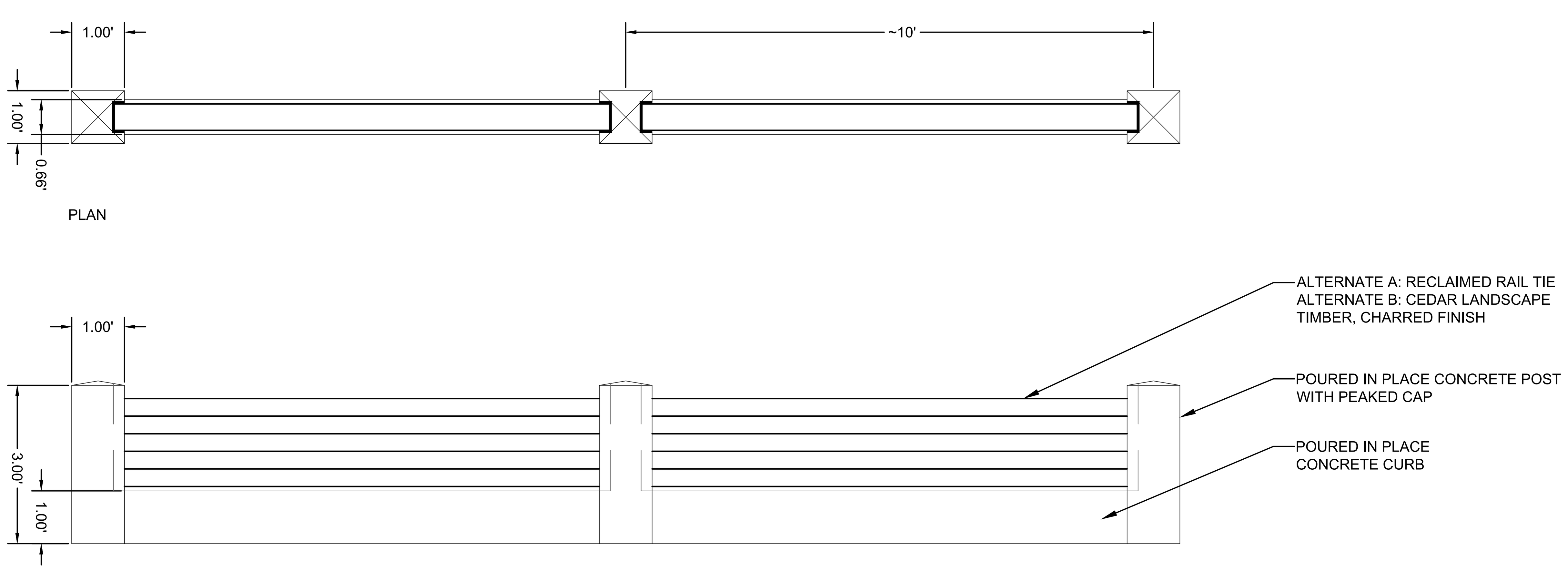
3 H 3.0 BIKE RACK INSTALLATION



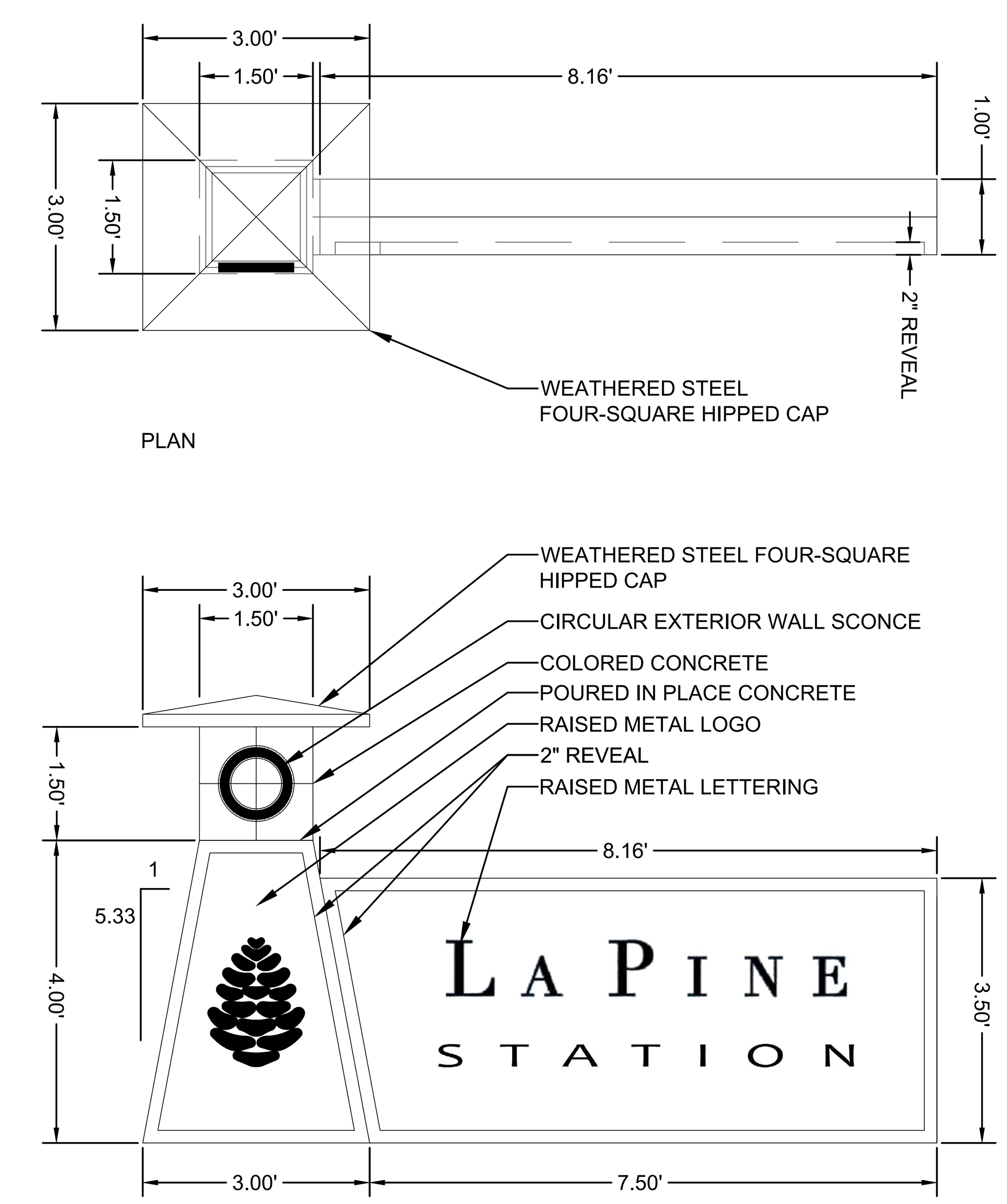
4 H 3.0 TRASH ENCLOSURE



5 H 3.0 RAIL AND TIES IN SOFTSCAPE



6 H 3.0 SITE WALL



7 H 3.0 SITE SIGNAGE

lapn_02_sp01.dwg

PRELIMINARY

LOCI studio

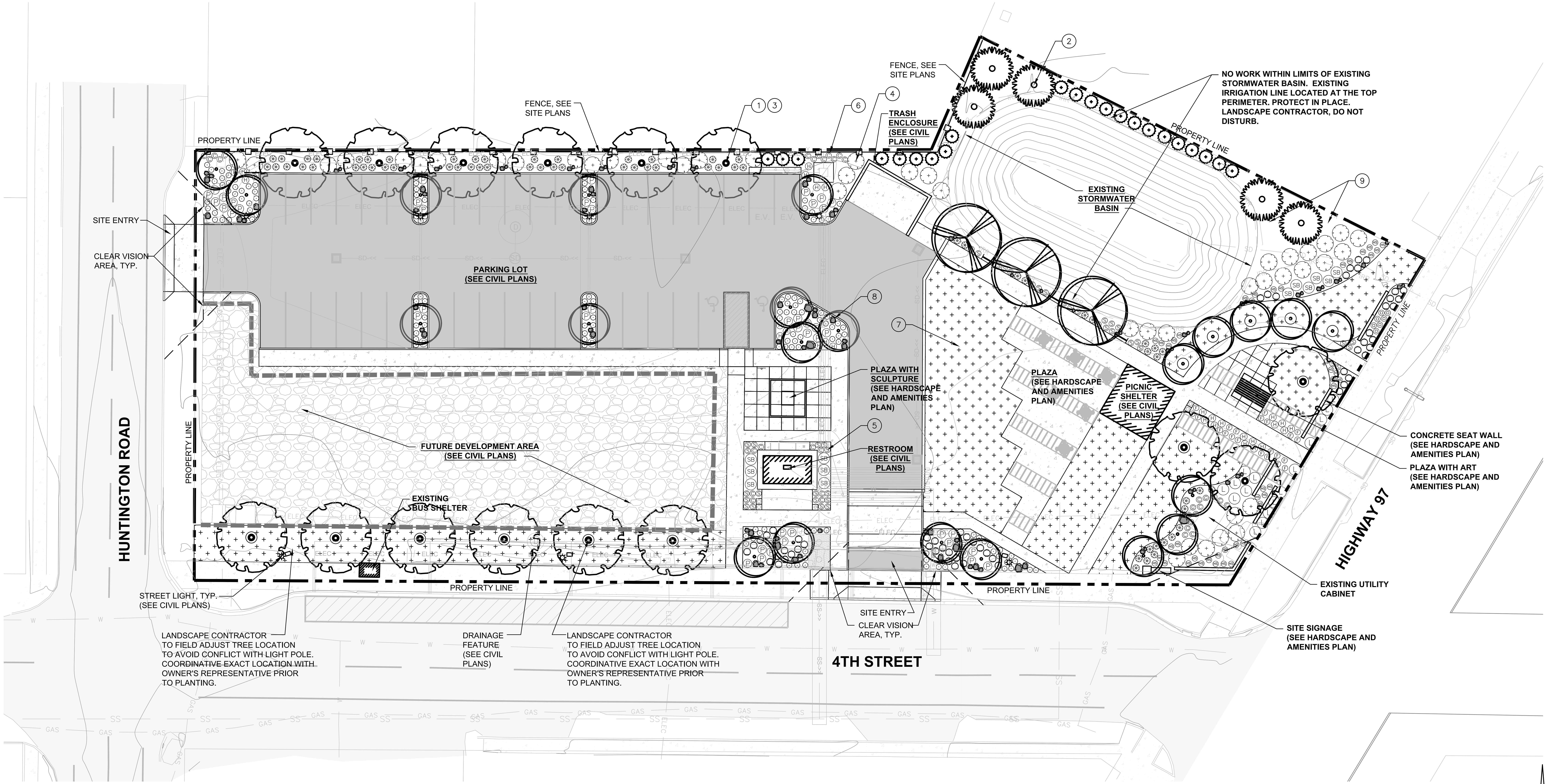
541.241.6134 WWW.LOCI.STUDIO

LA PINE STATION
HARDSCAPE AND AMENITIES DETAILS

PLOT DATE:	7/14/20	#	REVISION DESCRIPTION
DRAWN BY:	CJS	DATE	
CHECKED BY:			

HARDSCAPE DETAILS

H 3.0



PLANTING PLAN

0 10 20 40
SCALE: 1" = 20'

N

SHEET NOTES

1. INSTALL CONIFER TREE SPECIES AT LOCATIONS SHOWN. SEE DETAILS 1 AND 6, SHEET L1.2 AND PLANT AND MATERIALS SCHEDULE, SHEET L1.1.
2. INSTALL DECIDUOUS TREE SPECIES AT LOCATIONS SHOWN. SEE DETAILS 2 AND 6, SHEET L1.2 AND PLANT AND MATERIALS SCHEDULE, SHEET L1.1.
3. INSTALL ROOT BARRIER FOR ALL NEW TREES ADJACENT TO SIDEWALKS AND CURBS. SEE DETAIL 7, SHEET L1.1.
4. INSTALL SHRUB SPECIES AT LOCATIONS SHOWN. SEE DETAIL 3, SHEET L1.2 AND PLANT AND MATERIALS SCHEDULE, SHEET L1.1.
5. INSTALL PERENNIAL SPECIES AT LOCATIONS SHOWN. SEE DETAIL 4 AND 5, SHEET L1.2 AND PLANT AND MATERIALS SCHEDULE, SHEET L1.1.
6. INSTALL ORNAMENTAL GRASS SPECIES AT LOCATION SHOWN. SEE DETAIL 4 AND 5, SHEET L1.2 AND PLANT AND MATERIALS SCHEDULE, SHEET L1.1.
7. INSTALL SOD AT LOCATIONS SHOWN, SEE PLANT AND MATERIALS SCHEDULE, SHEET L1.1.
8. INSTALL LANDSCAPE BOULDERS AT LOCATIONS SHOWN. SEE DETAIL 8, SHEET L1.2 AND PLANTING LEGEND, SHEET L1.1.
9. INSTALL 3" DEPTH LAYER OF COMPOST MULCH.

PLANTING GENERAL NOTES

FOR PLANTING GENERAL NOTES, SEE SHEET L1.1.

DRAFT BID SET - NOT FOR CONSTRUCTION

P:\158_BEC (LA PINE TRANSIT CENTER)\BEC158-DWGS\SHEETS\ BEC158-L1.0_LANDSCAPE PLAN.dwg

PLANTING PLAN
4TH STREET TRANSIT CENTER
LA PINE, OR

KATRINA LANGENDERFER
LANDSCAPE ARCHITECTURE
KLLandArch.com
48 SE Bridgeford Blvd. | Suite 230
Bend, OR 97701 | 541.749.8526

REGISTERED LANDSCAPE ARCHITECT
Katrina J. Langenderfer
783
OREGON
11/09/2012
PRELIMINARY

DESIGNED:	KJL
DRAWN:	KJL
CHECKED:	MS
DATE:	9.27.2020

REVISIONS

DATE	NO.	DESCRIPTION

SHEET NO.
L1.0

JOB NO. BEC158

PLANT AND MATERIALS SCHEDULE

TYPE	LATIN NAME / COMMON NAME	SIZE	CONDITION	SPACING	QUANTITY	NOTE
TREES						
	Acer rubrum 'October Glory' / Acer Rubrum 'PNI 0268'	2–1/2" CAL.	B & B	AS SHOWN	15	
	Fraxinus pennsylvanica 'Summit' / Summit Green Ash	2–1/2" CAL.	B & B	AS SHOWN	3	
	Juniperus virginiana 'Idyllwild' / Idyllwild Juniper	8'–10' HT.	B & B	AS SHOWN	22	
	Picea pungens 'Moerheim' / Moerheim Blue Spruce	8'–10' HT.	B & B	AS SHOWN	5	
	Pyrus calleryana 'Glen's Form' / Chanticleer Pear	2–1/2" CAL.	B & B	AS SHOWN	22	
SHRUBS						
⊙	Berberis thunbergii 'Criruzam' / Crimson Ruby Japanese Barberry	2 GAL.	CONTAINER	AS SHOWN	134	
+	Physocarpus opulifolius 'Center Glow' / Center Glow Ninebark	5 GAL.	CONTAINER	AS SHOWN	44	
Ⓟ	Potentilla fruticosa 'Abbotswood' / Abbotswood Potentilla	3 GAL.	CONTAINER	AS SHOWN	49	
SB	Spirea x bumalda 'Goldflame' / Goldflame Spirea	3 GAL.	CONTAINER	AS SHOWN	12	
❁	Spirea japonica 'Yan' / Double Play Gold Spirea	3 GAL.	CONTAINER	AS SHOWN	68	
PERENNIALS						
ⓐ	Achillea x 'Moonshine' / Moonshine Yarrow	1 GAL.	CONTAINER	AS SHOWN	7	
L	Chrysanthemum x superbum 'Snowcap' (Leucanthemum) / Snowcap Shasta Daisy	1 GAL.	CONTAINER	AS SHOWN	16	
H	Hemerocallis x 'Stella de Oro' / Stella De Oro Dwarf Daylily	1 GAL.	CONTAINER	TRIANGULAR	28	
○	Nepeta x faassenii 'Walker's Low' / Walker's Low Catmint	1 GAL.	CONTAINER	AS SHOWN	56	
Ⓢ	Sedum spectabile 'Autumn Joy' / Autumn Joy Sedum	1 GAL.	CONTAINER	AS SHOWN	43	
GRASSES						
©	Calamagrostis x acutiflora 'Karl Forester' / Karl Forester Feather Reed Grass	2 GAL.	CONTAINER	AS SHOWN	34	
ⓕ	Festuca glauca 'Boulder Blue' / Boulder Blue Fescue	1 GAL.	CONTAINER	TRIANGULAR	22	
HG	Helicotrotrichon sempervirens/ Blue Oat Grass	2 GAL.	CONTAINER	AS SHOWN	45	
SOD						
	SOD - LAWN AREAS SOD AREA = 8,885 SF CENTRAL OREGON 3–WAY BLEND, SUPPLIED BY LOWER VALLEY TURF, TERREBONNE, OREGON. SOD COMPOSITION SHALL BE A BLEND OF KENTUCKY BLUEGRASS, PERENNIAL RYE AND NON–CREEPING FINE FESCUE. SOD SHALL BE SUPPLIED IN 30" ROLLS AND BE REGIONALLY ACCLIMATIZED.					
OTHER						
	LANDSCAPE BOULDER MATERIAL: CENTRAL OREGON MOSSY COVERED NATIVE LANDSCAPE BOULDERS (SIZE MIXTURE TO VARY), 1'L x 1'W x 1'H UP TO 3'L x 3'W x 3'H IN SIZE. COORDINATE PLACEMENT WITH OWNER'S REPRESENTATIVE.					

NOTE:
LOCATE AND FLAG ALL EXISTING TREES, SHRUBS, GRASSES AND PERENNIALS TO BE PROTECTED IN PLACE IN THE FIELD WITH THE OWNER'S REPRESENTATIVE PRIOR TO STARTING WORK. PROVIDE PROTECTION BARRIER AT DRIP LINE OF TREES AND SHRUBS AND AT BOUNDARIES OF GRASSES AND PERENNIALS.

PLANTING GENERAL NOTES

1. *ALL LANDSCAPE CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT CITY OF LA PINE STANDARDS AND THE STATE OF OREGON BUILDING AND SPECIALITY CODES.*
2. *INSTALL EROSION CONTROL SYSTEMS IN ACCORDANCE WITH CITY OF LA PINE STANDARDS PRIOR TO SITE WORK AND LANDSCAPE INSTALLATION.*
3. *MARK AND PROTECT ALL UTILITIES, SITE FEATURES, AND VEGETATION THAT ARE TO REMAIN IN PLACE. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING SYSTEMS RESULTING FROM WORK UNDER THIS CONTRACT.*
4. *PRIOR TO PLANTING, ON–SITE SOILS SHALL BE TESTED FOR SOIL FERTILITY BY A CERTIFIED TESTING LAB. PLANTING SOILS FOR DISTURBED AREAS, TREE PITS, SHRUB, AND PLUG AREAS SHALL THEN BE AMENDED AS RECOMMENDED BY THE SOIL FERTILITY REPORT RECOMMENDATIONS. TOPSOIL SAVED AND/OR STOCKPILED MAY BE USED IN THE MANUFACTURING OF PLANTING SOIL PER THE RECOMMENDATIONS OF THE SOIL FERTILITY REPORT. ON–SITE SOILS AND TOPSOIL MAY NOT BE USED AS PLANTING SOIL UNLESS AMENDED PER THE SOILS FERTILITY REPORT.*
5. *PRIOR TO PLANTING, EXISTING VEGETATED AREAS TO BE PROTECTED IN PLACE DURING CONSTRUCTION SHALL RECEIVE WEED ABATEMENT BY LANDSCAPE CONTRACTOR. LANDSCAPE CONTRACTOR TO PRESENT A WRITTEN STRATEGY FOR WEED ABATEMENT TO THE OWNER'S REPRESENTATIVE FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.*
6. *EXACT LOCATION OF PLANT MATERIAL SHALL BE REVIEWED BY THE OWNER'S REPRESENTATIVE IN THE FIELD PRIOR TO INSTALLATION. OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO ADJUST PLANTS EXACT LOCATION IN THE FIELD.*
7. *ALL PLANTS SHALL BE GROWN IN THIS REGION OR BE LOCALLY ACCLIMATIZED.*
8. *PLANT MATERIAL INSTALLED SHALL CONFORM IN SIZE AND GRADE TO THE "AMERICAN STANDARD FOR NURSERY STOCK" CURRENT EDITION.*
9. *ALL DISTURBED AREAS WITHIN LIMITS OF WORK AND NEW PLANTING BEDS AND PLANTING AREAS SHALL RECEIVE 6" PLANTING SOIL, TILLED INTO THE TOP 12" DEPTH OF EXISTING SOILS. LEGALLY DISPOSE OF ANY EXCESS SUBSOIL OFF–SITE.*
10. *PRIOR TO PLANTING, ALL PLANTING AREAS SHALL BE FINE GRADED AND RECEIVE SOIL PREPARATION.*
11. *FINISH GRADES OF ALL PLANTING AREAS SHALL BE 2" BELOW ADJACENT CURB, PAVEMENT OR FEATURE.*
12. *ALL TOPSOIL SCRAPED DURING CONSTRUCTION MAY BE STOCKPILED ON–SITE FOR REUSE IN ACCORDANCE WITH SOIL TEST RECOMMENDATIONS.*
13. *PLANTS AND CONSTRUCTION MATERIALS SHALL BE REVIEWED, INSPECTED AND APPROVED ON–SITE BY OWNER'S REPRESENTATIVE PRIOR TO PLANTING OR USE ON PROJECT.*
14. *LANDSCAPE INSTALLATION SHALL INCLUDE PROVISION OF AN AUTOMATIC IRRIGATION SYSTEM TO SUSTAIN LANDSCAPE PLANTINGS, MEETING LOCAL CODES.*
15. *LANDSCAPE CONTRACTOR SHALL INSTALL AUTOMATIC IRRIGATION SYSTEM PER IRRIGATION PLANS, DETAILS AND PROJECT SPECIFICATIONS.*
16. *INSTALL 3" LAYER OF COMPOST MULCH TO ALL NON–SODDED PLANTING AREAS AND NON–PLANTED AREAS..*
17. *LANDSCAPE CONTRACTOR SHALL WATER AND MAINTAIN PLANTINGS PRIOR TO PROJECT FINAL COMPLETION.*
18. *LANDSCAPE CONTRACTOR SHALL MAINTAIN IRRIGATION SYSTEM PRIOR TO PROJECT FINAL COMPLETION.*
19. *LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANTINGS TO BE ALIVE AND IN SATISFACTORY HEALTH FOR ONE YEAR FROM PROJECT FINAL COMPLETION.*
20. *LANDSCAPE CONTRACTOR SHALL WARRANTY ALL PLANTINGS ONE YEAR FROM PROJECT FINAL COMPLETION.*
21. *SEE PROJECT SPECIFICATIONS FOR CLARIFICATION AND ADDITIONAL DETAIL.*

PLANT AND MATERIALS SCHEDULE AND NOTES
4TH STREET TRANSIT CENTER
LA PINE, OR

KATRINA LANGENDERFER
LANDSCAPE ARCHITECTURE
KLLandArch.com
45 SE Bridgford Blvd | Suite 200
Bend, OR 97701 | 541.749.8526

REGISTERED LANDSCAPE ARCHITECT
OREGON
Katrina J. Langenderfer
11/09/2010
783
PRELIMINARY

DESIGNED:	KJL		
DRAWN:	KJL		
CHECKED:	MS		
DATE:	9.27.2020		

REVISIONS		
NO.	DESCRIPTION	DATE

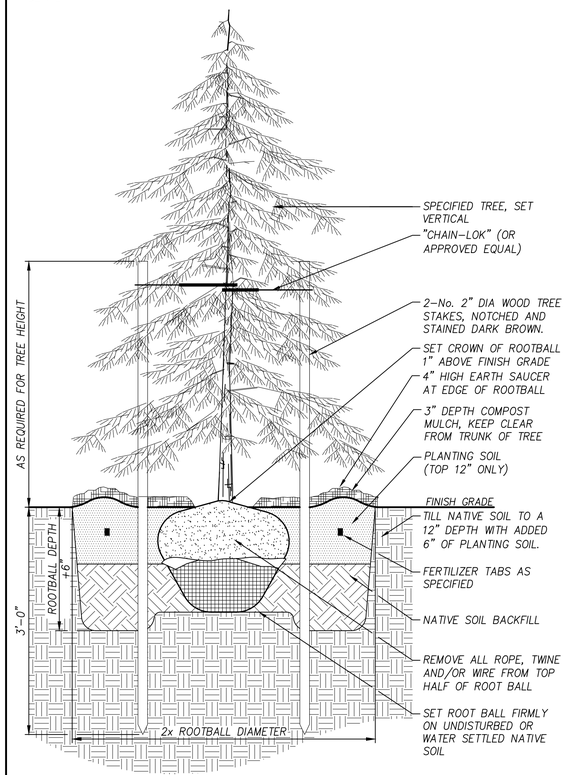
SHEET NO.
L1.1

JOB NO.
BEC158

DRAFT BID SET - NOT FOR CONSTRUCTION

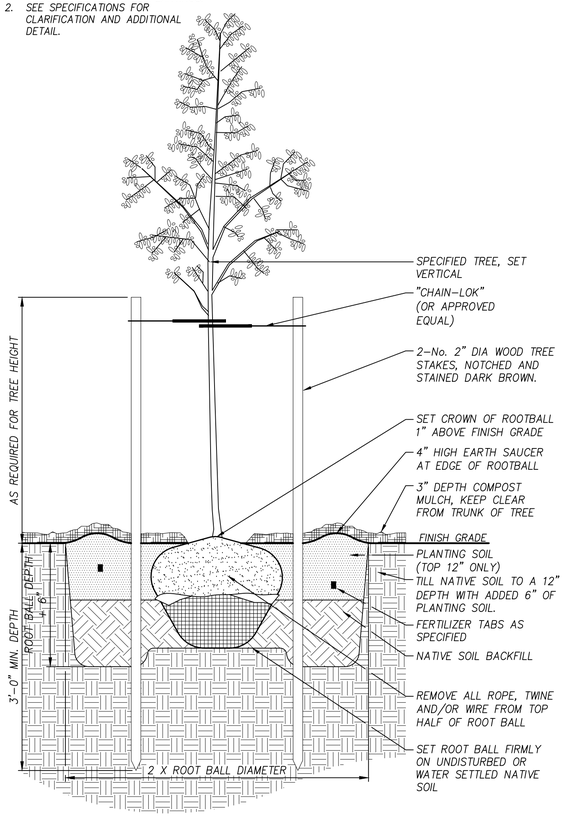
P:\158 BEC (LA PINE TRANSIT CENTER)\BEC158-DWGS\SHEETS\ BEC158-L1.0 LANDSCAPE PLAN.dwg

NOTE:
1. PROVIDE 36" DIAMETER MULCH RING AROUND ALL NEW TREE PLANTINGS.
2. SEE SPECIFICATIONS FOR CLARIFICATION AND ADDITIONAL DETAIL.

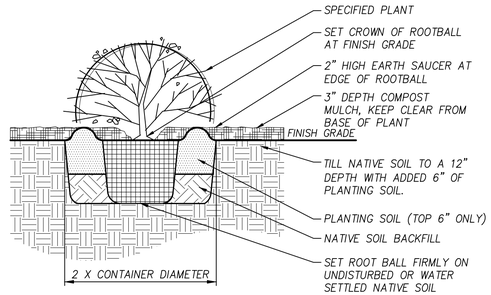


1 CONIFER TREE PLANTING
Section
NOT TO SCALE

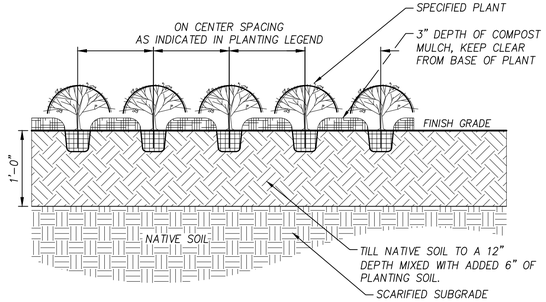
NOTE:
1. PROVIDE 36" DIAMETER MULCH RING AROUND ALL NEW TREE PLANTINGS.
2. SEE SPECIFICATIONS FOR CLARIFICATION AND ADDITIONAL DETAIL.



2 DECIDUOUS TREE PLANTING
SECTION
NOT TO SCALE

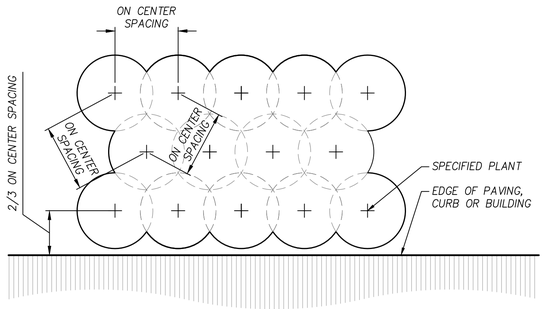


3 SHRUB PLANTING
SECTION
NOT TO SCALE



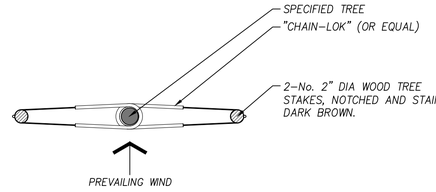
4 PERENNIAL AND ORNAMENTAL GRASS DETAIL
SECTION
NOT TO SCALE

NOTE:
ON CENTER SPACING SHALL BE AS INDICATED IN PLANTING LEGEND.

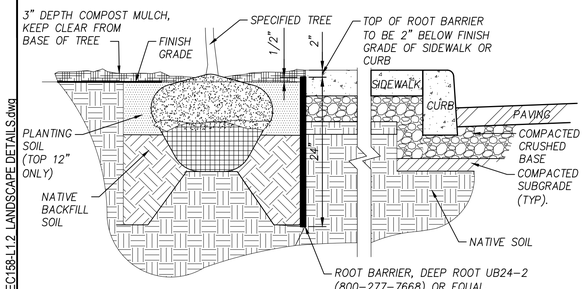


5 TRIANGULAR SPACING
PLAN
NOT TO SCALE

NOTES:
1. TWICE WRAP TREE TIES AROUND NOTCHED STAKE AND TWIST ENDS TO SECURE (ALLOWING TRUNK TO MOVE 3" IN ALL DIRECTIONS).
2. INSTALL TREE STAKES PARALLEL TO ADJACENT R/W, CURB OR WALK, WHERE SAFETY OR CONFLICT MAYBE AN ISSUE VS. STANDARD PREVAILING WIND ORIENTATION.



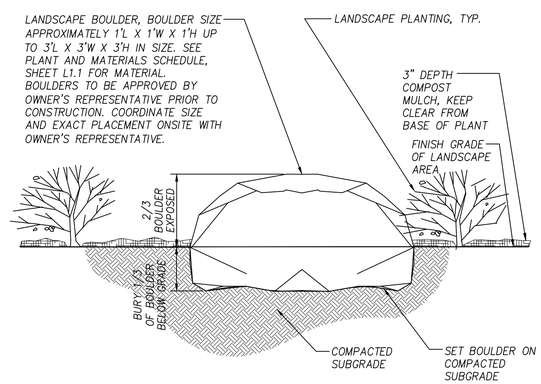
6 TREE STAKING
PLAN
NOT TO SCALE



NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. THE RAISED ROOT GUIDING RIBS MUST BE FACING TOWARDS THE TREE ROOTS.
3. THE TOP OF THE BARRIER PANELS MUST BE ½" ABOVE FINISHED GRADE.
4. POSITION BARRIER PANELS VERTICALLY WITH TOP AGAINST THE STRUCTURE TO BE PROTECTED.
5. SEE LANDSCAPE PLAN TO DETERMINE TREES THAT REQUIRE BARRIER PANEL.

7 ROOT BARRIER
SECTION
NOT TO SCALE

LANDSCAPE BOULDER, BOULDER SIZE APPROXIMATELY 1'L X 1'W X 1'H UP TO 3'L X 3'W X 3'H IN SIZE. SEE PLANT AND MATERIALS SCHEDULE, SHEET L1.1 FOR MATERIAL. BOULDERS TO BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION. COORDINATE SIZE AND EXACT PLACEMENT ONSITE WITH OWNER'S REPRESENTATIVE.



8 BOULDER IN LANDSCAPE
SECTION
NOT TO SCALE

DRAFT BID SET - NOT FOR CONSTRUCTION

PLANTING DETAILS
4TH STREET TRANSIT CENTER
LA PINE, OR

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REGISTERED LANDSCAPE ARCHITECT
OREGON
783
Katrina J. Langenderfer
11/09/2020
PRELIMINARY

DESIGNED:	KJL	DATE	NO.	DESCRIPTION
DRAWN:	KJL			REVISIONS
CHECKED:	MS			
DATE:	9.27.2020			

SHEET NO.
L1.2

JOB NO.
BEC158

P:\158 BEC (LA PINE TRANSIT CENTER)\BEC-158-DWGS\SHEETS\ BEC158-L1.2 LANDSCAPE DETAILS.dwg

LA PINE
OREGON

CITY OF LA PINE

16345 Sixth Street — PO Box 2460
La Pine, Oregon 97739
TEL (541) 536-1432 — FAX (541) 536-1462
www.lapineoregon.gov

City Manager's Report – March 10th, 2021

Administration:

City Administration has continued to focus work on operations management, while providing direction to the City's enterprise activities. Following is an inventory of work performed over the period since our last Council meeting.

Personnel and Appointments:

City Management has decided to bifurcate administrative and finance duties for the current period. This, most notably, has resulted in the promotion of Ms. Jamie Kraft to City Recorder. Ms. Kraft will be taking on all the duties previously managed by Ms. Robin Neace. To permit Ms. Kraft the necessary time in her new role, the City is actively recruiting for two administrative positions:

1. Office Account Clerk: This position will be responsible for front office reception, utility account payments (AR) and general administrative support to the Recorder and City Manager. Their direct report will be to the City Recorder.
2. Staff Accountant: This position will take on all accounting functions for the City and support Public Works in project management (finance) given the City's upcoming large scale capital improvement projects. The position has been advertised as a growth opportunity, allotting for the right candidate to potentially join the management team as the City grows fiscally.

Both positions have been advertised on the City's Website, the City's Facebook account, and through the League of Oregon Cities.

With the recent reduction of staff in Public Works, we are also advertising for a Utility Worker. This recruitment allows for either an entry level employee (Utility Worker I), or a seasoned professional (Utility Worker II) who would bring current water or wastewater certifications to the position. The position has been advertised on the City's Website, the City's Facebook Page, and through the Oregon Association of Water Utilities.

It is of note that our current Utility I employees are registering for the Wastewater level I collections exam which we anticipate them sitting for in the next two months.

Economic Development:

The City, in concert with its SLED representative has drafted and proofed and advertisement for the Spec. Building project that will be placed in the Oregon Daily Journal of Commerce. Proposals must be received by the City prior to 4:30 p.m., on May 15, 2021

Copies of the Request for Proposal will also be available on March 15, 2021 and it is being advertised that the Council will award the project by June 16th, 2021 to permit potential groundbreaking and construction during the summer months.

Community Interest:

As proposed to the Council by Ms. Pat Stone, City Administration drafted a letter to Cascade East Transit (CET) asking for a reconsideration of stops along route 31. After City Administration submitted the communication on behalf of Council, and a recent meeting with industry stakeholders, CET has stated that they are investigating and interested n a potential stop on the route originating from the La Pine Senior Center. This stop would provide enhanced safety to riders who are currently required to cross Huntingtin Rd. without the aid of a designated crossing, or a suitable walking surface along the western border.

Sincerely,

Geoff Wullschlager
City Manager