



NORTH OGDEN CITY
— SETTLED 1851 —

PLANNING COMMISSION MEETING
SEPTEMBER 07, 2022 AT 6:00 PM
505 EAST 2600 NORTH
NORTH OGDEN, UT 84414

PUBLIC CAN ATTEND IN PERSON, OR:

Click the link to join the webinar: <https://us02web.zoom.us/j/82546367336> Webinar ID: 825 4636 7336
Or Telephone Dial: 1 669 900 9128 or 1 253 215 8782 or 1 346 248 7799 or +1 646 558 8656
YouTube: <https://www.youtube.com/channel/UCrigbePBxTucXEzRr6fclhQ/videos>

Welcome: Chairman Thomas

Invocation or Thought: Commissioner Webb

Pledge of Allegiance: Commissioner Nancarrow

1. Roll Call
2. Minutes Consideration:
 - a. Consideration and action to approve the July 6, 2022 Planning Commission Meeting minutes
3. Opening Meeting Statement
4. Ex parte communications or conflicts of interest to disclose
5. Public comments for items not on the agenda

LEGISLATIVE ITEMS

6. ZTA 2022-09 Public hearing, consideration, and recommendation on a legislative amendment to revise the retaining wall standards to add clarifying language in Title 11 Grading and Drainage Standards
Presenter: Scott Hess, Planning Director
 - a. Public Hearing
 - b. Consideration and recommendation
7. ZTA 2022-10 Public hearing, consideration, and recommendation on a legislative amendment to update the Public Works Standards adopted by ordinance and referenced in North Ogden City Zoning Code Title 11
Presenter: Scott Hess, Planning Director
 - a. Public Hearing
 - b. Consideration and recommendation
8. Public comments
9. Remarks - Planning Commissioners
10. Report - Planning Director
11. Remarks - City Manager/Attorney
12. Adjournment

CERTIFICATE OF POSTING

The undersigned, duly appointed City Recorder, does hereby certify that the above notice and agenda was posted within the North Ogden City limits on this 1st day of September, 2022 at North Ogden City Hall, on the City Hall Notice Board, on the Utah State Public Notice Website, and at <http://www.northogdencity.com>. The 2022 meeting schedule was also provided to the Standard Examiner on December 16, 2021.

The Planning Commission at its discretion, may rearrange the order of any item(s) on the agenda. Final action may be taken on any item on the agenda. In compliance with the American with Disabilities Act, individuals needing special accommodation (including auxiliary communicative aids and service) during the meeting should notify the City Recorder at 801-782-7211 at least 48 hours prior to the meeting. In accordance with State Statute, City Ordinance and Council Policy, one or more Planning Commission Members may be connected via speakerphone. Susan L. Nance, CMC, City Recorder



NORTH OGDEN CITY

SETTLED 1851

NORTH OGDEN PLANNING COMMISSION MEETING MINUTES July 6, 2022

The North Ogden Planning Commission convened in a regular meeting on July 6, 2022, at 6:01 p.m. The meeting was also held on Zoom. Notice of time, place and agenda of the meeting was furnished to each member of the Planning Commission, posted on the bulletin board at the municipal office and posted to the Utah State Website on June 30, 2022. Notice of the annual meeting schedule was published in the Standard-Examiner on December 16, 2021.

COMMISSIONERS:

Eric Thomas	Chairman	
Brandon Mason	Vice-Chairman	arrived at 6:45 p.m.
Scott Barker	Commissioner	excused
Alan Lunt	Commissioner	
Nicole Nancarrow	Commissioner	
Johnson Webb	Commissioner	
Cody Watson	Commissioner	

STAFF:

Jon Call	City Manager/Attorney
Brandon Bell	Associate Planner
Tiffany Staheli	Parks & Recreation Director
Eric Casperson	City Engineer

VISITORS:

Jarod Thorpe	Joel Prince	Thomas Hunt
Cecil Satterthwaite	John Newhall	Pat Burns
Rhett Buttars	Stefanie Casey	

Chairman Thomas called the meeting to order at 6:01 p.m. Commissioner Webb offered the invocation and Commissioner Nancarrow led the Pledge of Allegiance.

1. **ROLL CALL**

Chairman Thomas conducted roll call and indicated Vice Chairman Mason and Commissioner Barker have been excused.

2. **MINUTES CONSIDERATION**

Consideration and action to approve the May 4, 2022 and June 1, 2022 Planning Commission Meeting minutes

Commissioner Lunt made a motion to approve the May 4, 2022 and June 1, 2022 Planning Commission Meeting minutes. Commissioner Nancarrow seconded the motion.

Voting on the motion:

Chairman Thomas	aye
Vice Chairman Mason	absent
Commissioner Barker	absent
Commissioner Lunt	aye
Commissioner Nancarrow	aye
Commissioner Webb	aye
Commissioner Watson	aye

The motion carried.

3. **OPENING MEETING STATEMENT**

Chairman Thomas read the opening meeting statement.

4. **EX PARTE COMMUNICATIONS OR CONFLICTS OF INTEREST TO DISCLOSE**

Chairman Thomas asked if any member of the Commission had any ex parte communications or conflicts of interest to disclose. No disclosures were made.

5. **PUBLIC COMMENTS FOR ITEMS NOT ON THE AGENDA**

There were no public comments.

Chairman Thomas announced staff has requested that the agenda be rearranged to move item seven ahead of item six. He asked for a motion to that effect.

Commissioner Nancarrow made a motion to amend the agenda to move item seven ahead of item six. Commissioner Webb seconded the motion.

Voting on the motion:

Chairman Thomas	aye
Vice Chairman Mason	absent
Commissioner Barker	absent
Commissioner Lunt	aye
Commissioner Nancarrow	aye
Commissioner Webb	aye
Commissioner Watson	aye

The motion carried.

ADMINISTRATIVE ITEMS

7. SUB 2021-12 CONSIDERATION AND ACTION REGARDING AN ADMINISTRATIVE APPLICATION, PRELIMINARY APPROVAL OF THE NORTHVIEW ESTATES SUBDIVISION PHASE 9 (29 LOTS) LOCATED AT APPROXIMATELY 600 EAST AND MOUNTAIN ROAD

Associate Planner Bell reported this application is actually for preliminary approval, not final approval as advertised on the agenda. He then noted the applicant is requesting preliminary approval for the Northview Estates Subdivision Phase 9, which consists of 29 lots. The property on which this proposed subdivision is located is currently vacant and is located at approximately 3800 North and 600 East. The current zoning is HP-1. The Technical Review Committee met on November 8, 2021 regarding this proposed subdivision. The City Engineer submitted a review memo dated June 29, 2021 and the City has received a will-serve letter for Central Weber Sewer and for secondary water. He then summarized staff review of the application as well as proposed Planning Commission considerations, after which he concluded the proposed subdivision meets the requirements of applicable North Ogden City ordinances and conforms to the North Ogden City General Plan. This area is in the Hillside neighborhood and the General Plan map calls for this property to be developed as low-density residential. Recommended conditions of approval include the following:

- Requirements of the North Ogden City Engineer's Report must be met prior to final plat approval, except where superseded in the staff report.
- Requirements of the Technical Review Committee Letter (except where it may be superseded in the staff report).
- A 5-foot sidewalk needs to be built on the south side of the Mountain Road Right of way, and a 6-foot asphalt trail along the North side of Mountain Road. The design of the right-of-way also needs to include two 5-foot bike lanes.
- A 10-foot walkway needs to be built on Parcels A and B.
- The notes on the plat or plans regarding typical public utility easement needs to ensure that sidewalk repair, construction and re-construction are included as part of the purpose and use of the easement.

Staff recommends that the Planning Commission grant preliminary approval of the Northview Estates Subdivision Phase 9 subject to the conditions recommended in this Staff Report.

Commissioner Nancarrow asked if the block length exception is included in the Engineer's report or if it should be included in the motion. Mr. Bell stated that it is addressed in the Engineer's report and does not need to be mentioned in the motion. Commissioner Nancarrow inquired as to the difference between durability and maintenance needs for concrete versus maintenance. Mr. Bell stated there are pros and cons for each material and there is not clarity as to which is better for a trail. The Parks and Recreation Director currently maintains asphalt trails and is not opposed to the use of asphalt in this project.

Chairman Thomas invited input from the applicant.

Cecil Satterthwaite stated that his only question or concern relates to the six-foot asphalt walking path; generally, when a project like this is completed, those types of improvements are completed at the very end; if it is installed at the first, it will be broken by large equipment and need to be replaced. Additionally, there will be awkward areas of transition between concrete and asphalt. He would prefer concrete, and he will make it six-feet wide; it would be much easier to replace sections of concrete in the future rather than an entire length of asphalt.

Discussion among the Commission and Mr. Satterthwaite centered on the locations of the asphalt trail and ongoing maintenance of the improvements; they focused on the length of the run of asphalt that Mr. Satterthwaite would be required to install and the manner in which the transition between the asphalt and concrete will be completed. The Commission thanked Mr. Satterthwaite for his thoughtfulness related to this component of the subdivision. Chairman Thomas noted the recommendations that have been made are based upon City ordinances regarding trail improvements. Commissioner Nancarrow stated that an ordinance amendment would be needed in order to waive the requirement for asphalt trail improvements.

Chairman Thomas invited public input. There were no persons appearing to be heard.

Chairman Thomas invited input from the Parks and Recreation Director.

Parks and Recreation Director Staheli stated she is not opposed to using a different material to construct the trail; rather, her main focus is the preservation of the trail requirement in this area. Asphalt trails are more widely used than a concrete sidewalk; for some reason, users do not recognize a widened concrete path as a trail. She is willing to consider modifications to the materials requirements and allow something like stamped concrete that would make it identifiable as a trail. She wants trail improvements to be uniform and cohesive and that is why it was included in the public works design standards. There was then brief discussion about bollard lighting along the trailway and trail signage.

Vice Chairman Mason asked if trail material is more important than trail connectivity; he wondered if a section of concrete that connects two sections of asphalt trail will be as widely used as if it were asphalt itself. Ms. Staheli stated that both are important factors; when a trail looks like a trail, people go out of their way to use it. The same is true for trails with good connectivity. If an asphalt trail connects to a wider sidewalk, some people will stop at that point

because they are unsure where the wider sidewalk will lead them. She is trying to ensure consistency in trail development throughout the City.

Commissioner Nancarrow stated that she feels the Commission needs to base their recommendations/actions upon what the ordinance requires and if the Council wants to provide an exception to trail material standards, that is within their scope. This led to high level discussion among the Commission regarding the trail improvements aspect of the project.

Mr. Satterthwaite then noted that there are five-foot bike lanes on both sides of Mountain Road. Vice Chairman Mason noted those bike lanes are on the actual road. Mr. Satterthwaite stated that is correct; there is a five-foot sidewalk on the south side of the road, five-foot bike lanes on both sides of the road, and then he will be required to install an asphalt trail on the north side of Mountain Road. He stated that most road bikers like to be in the road, so that is appropriate, but there may be an excess of sidewalk/trail in the area. He stated he still believes that concrete is appropriate for the trail, and he believes that improved signage can help to communicate to residents that the concrete section is, in fact, a trail.

Commissioner Nancarrow suggested the Commission make a recommendation to the City Council that they explore options for trail materials and consider an adjustment to the public work standards for this particular project. Chairman Thomas suggested that the Commission take action on the application before them, with approval of the concrete sidewalk pending an ordinance change by the City Council prior to final approval.

Commissioner Nancarrow made a motion to approve application SUB 2021-12, preliminary approval of the Northview Estates Subdivision Phase 9 (29 lots), located at approximately 600 East and Mountain Road, based on the findings and subject to the conditions listed in the staff report, and with approval of a concrete (or other material) trail pending a public works standard ordinance change by the City Council prior to final approval. Commissioner Webb seconded the motion.

City Manager/Attorney Call noted he received a text message from Ms. Staheli about the Commission's conversation regarding the actual location of the trail. He stated that she indicated she does not prefer trails be located in the front of homes, but that often there are limitations that prevent the construction of a trail in the rear yard or between lots. The consensus was to allow a widened sidewalk in the public works standards because a six-foot sidewalk is not often recognized as a trail by users.

Voting on the motion:

Chairman Thomas	aye
Vice Chairman Mason	aye
Commissioner Barker	absent
Commissioner Lunt	aye
Commissioner Nancarrow	aye
Commissioner Webb	aye
Commissioner Watson	aye

The motion carried.

6. SPR 2022-04 CONSIDERATION AND ACTION REGARDING AN ADMINISTRATIVE APPLICATION, SITE PLAN APPROVAL FOR TOWNHOMES LOCATED AT APPROXIMATELY 2031 NORTH WASHINGTON BOULEVARD

Associate Planner Bell reported the applicant has submitted an application for townhomes at approximately 2050 North and Washington Boulevard. The applicant needs to submit a companion subdivision application. The applicant has an application for rezone which has been approved by the City Council, subject to this site plan approval, and the subsequent subdivision application. Any approval granted for this site plan should be subject to the approval of that subdivision, as a condition of approval. He discussed staff's site plan review process, focusing briefly upon permitted uses, setbacks, landscaping and site design standards, exterior lighting, and conformance with the General Plan. He concluded recommended conditions of approval include:

- Any approval granted for this site plan should be subject to the approval of that subdivision.
- The applicant provide updated approval from UDOT, in writing, permitting approval of the extension of the private drive, and continued use of the access onto Washington Boulevard, given the proposed additional units.
- The existing cross access easement for the existing phase, will need to extend to allow the property owner of the parcel to the north of where the new townhomes are proposed, to have access to this private drive, if that property is developed. (This will assist in preserving the opportunity for a potential future connection to Washington Boulevard).
- A playground with play equipment be added, to meet the above requirement, and that this item be delegated to Staff for approval.
- The applicant needs to add 8 flowering shrubs, 12 additional shrubs (of any type), 12 deciduous trees and 2 evergreen trees to meet the landscaping requirement for these buildings. A landscape plan should be provided, and that this item be delegated to Staff for approval. A landscape plan should be submitted showing the addition of these plant. The trees should be 2" caliper or greater.
- The location of the light poles on the site plan has not been provided and needs to be submitted. A maximum of 600' spacing between light poles is permitted. The design of the actual light poles will be approved as part of building permits, and as such may be delegated to Staff, with the location and design of the light poles being required to be submitted for approval prior to the issuance of the first building permit.

Staff recommends approval of the conditional use permit subject to conditions in this Staff report, the Technical Review Committee (TRC) Meeting Letter, and the Engineer's Review Comments.

Vice Chairman Mason asked if the proposed density of the project exceeds allowances. Mr. Bell answered no, it meets density restrictions.

Chairman Thomas invited input from the applicant.

Thomas Hunt, Engineer for the project, stated he has nothing to add to Mr. Bell's presentation.

Pat Burns added that he feels that the City is “opening Pandora’s Box” by asking him to approach the Utah Department of Transportation (UDOT) for any access issues; UDOT has already communicated their desires, which are to create access from 2300 North, and it is his opinion that they will take a great deal of time to consider something different and eventually uphold what they have already communicated. He stated that he feels it is best to complete the connection to 2300 North and make other improvements as needed. This led to discussion and review of the manner in which connectivity to 2300 North will be completed. City Manager/Attorney Call indicated the City simply needs some communication from UDOT indicating they are comfortable with the final design and connectivity plan. Joel Prince stated the consideration of the cross-access easement for private property does not make sense to him. Chairman Thomas stated that is based upon a requirement from UDOT and based upon the original approval for the subject property. This led to high level philosophical discussion and debate regarding the intent for the cross-access easement and agreements regarding payment for ongoing maintenance and connectivity for future development of the area; the City would like an executed agreement to preserve cross access easement while allowing for shared cost of maintenance.

Chairman Thomas invited public input. There were no persons appearing to be heard.

Commissioner Nancarrow made a motion to approve application SPR 2022-04, site plan approval for townhomes located at approximately 2031 North Washington Boulevard, based on the findings and subject to the conditions listed in the staff report, with the change to the second condition of approval to read as follows: “delegate to staff to review UDOT requirements and reach an agreement with the applicant that they will meet the UDOT requirements with the extension of the private drive and continued use of the access onto Washington Boulevard and also preserve the cross access easement while allowing for shared maintenance costs.” Commissioner Lunt seconded the motion.

Voting on the motion:

Chairman Thomas	aye
Vice Chairman Mason	aye
Commissioner Barker	absent
Commissioner Lunt	aye
Commissioner Nancarrow	aye
Commissioner Webb	nay
Commissioner Watson	aye

The motion carried.

8. PUBLIC COMMENTS

There were no public comments.

9. REMARKS - PLANNING COMMISSIONERS

Vice Chairman Mason made a motion to reconsider the motion to approve the May 4, 2022 and June 1, 2022 Planning Commission Meeting minutes. Commissioner Lunt seconded the motion.

Voting on the motion:

Chairman Thomas	aye
Vice Chairman Mason	aye
Commissioner Barker	absent
Commissioner Lunt	aye
Commissioner Nancarrow	aye
Commissioner Webb	aye
Commissioner Watson	aye

The motion carried.

Vice Chairman Mason made a motion to amend the May 4, 2022, page 7, where he is listed as absent in the meeting, but also voting on item 7, and approve the May 4, 2022 and June 1, 2022 Planning Commission Meeting minutes. Commissioner Lunt seconded the motion.

Voting on the motion:

Chairman Thomas	aye
Vice Chairman Mason	aye
Commissioner Barker	absent
Commissioner Lunt	aye
Commissioner Nancarrow	aye
Commissioner Webb	aye
Commissioner Watson	aye

The motion carried.

Chairman Thomas then reviewed the meeting schedule for the remainder of the summer.

10. REPORT - PLANNING DIRECTOR

Associate Planner Bell reported on upcoming training opportunities for the Planning Commission.

11. REMARKS – CITY MANAGER/ATTORNEY

City Manager/Attorney reported on the upcoming summer party for City employees; more information will be coming as soon as it is available.

12. **ADJOURNMENT**

Commissioner Lunt made a motion to adjourn the meeting. Commissioner Nancarrow seconded the motion.

Voting on the motion:

Chairman Thomas	aye
Vice Chairman Mason	aye
Commissioner Barker	absent
Commissioner Lunt	aye
Commissioner Nancarrow	aye
Commissioner Webb	aye
Commissioner Watson	aye

The motion carried.

The meeting adjourned at 7:40 pm

Eric Thomas
Planning Commission Chair

Joyce Pierson
Deputy City Recorder

Date Approved

PLANNING COMMISSION

OPENING MEETING STATEMENT

Before each agenda item begins City staff will give a report. After the staff report, the item will be opened for other speakers. The applicant will speak first and be allowed up to 10 minutes. Following the applicant, any other interested person will be allowed to speak for up to 3 minutes. The applicant has final rebuttal time of up to 5 minutes.

Any materials that are displayed or referenced, e.g., pictures or written materials are part of the record and must be left with the Commission.

Speakers are required to have signed in at the door and will state their name and address before beginning their remarks. If you agree with a previous speaker then state your agreement to avoid repetitious remarks.

Speakers shall address the Commission from the podium or microphone and shall address all comments to the Planning Commission.

Please silence your phone.

OPENING MEETING STATEMENT (ZOOM)

Before each agenda item begins City staff will give a report. After the staff report, the item will be opened for other speakers. The applicant will speak first and be allowed up to 10 minutes. Following the applicant, any other interested person will be allowed to speak for up to 3 minutes. The applicant has final rebuttal time of up to 5 minutes.

Any materials that are displayed or referenced, e.g., pictures or written materials are part of the record and must be forwarded to the Commission.

Speakers are required to have registered their full name on Zoom and will state their name and address before beginning their remarks. If you agree with a previous speaker then state your agreement to avoid repetitious remarks.

Speakers shall address all comments to the Planning Commission.

Please silence your microphone until ready to speak.

Staff Report to the North Ogden City Planning Commission

SYNOPSIS / APPLICATION INFORMATION

Application Request: Consideration and action on a legislative amendment to revise the retaining wall standards to add clarifying language in Title 11 Grading and Drainage Standards

Agenda Date: September 7, 2022

Applicant: North Ogden City

File Number: ZTA 2022-09

PUBLIC NOTICE:

Mailed Notice: None

Newspaper:

City Website: August 22, 2022 (public hearing notice)

STAFF INFORMATION

Scott A. Hess
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shess@nogden.org

APPLICABLE ORDINANCES

11: 11-22-1-G-8 GRADING AND DRAINAGE STANDARDS

LEGISLATIVE DECISION

When the City is considering a legislative matter, the Planning Commission acts as a recommending body to the City Council. The City has wide discretion in taking legislative action. Examples of legislative actions are general plan, zoning map, and land use text amendments. Legislative actions require that the Planning Commission give a recommendation to the City Council. Typically the criteria for making a decision, related to a legislative matter, require compatibility with the general plan and existing codes.

BACKGROUND

The Planning, Engineering, and Building Departments regularly have questions and concerns over retaining walls in North Ogden City. These can be new walls constructed along with homes, or retaining walls required as part of a subdivision approval. Generally, the City's standards for retaining walls are able to be met by developers, home builders and home owners. The basic standards are: walls up to 4 feet tall are permitted without engineering, rock walls 4 to 6 feet tall are permitted with engineering, and concrete or block retaining walls up to 8 feet tall are permitted with engineering.

While most developments can conform to those basic regulations, there are times when special circumstances cause rock walls, retaining walls, and other hillside development to exceed the required standards in Title 11. When these special cases come up, the City's Planning and

Engineering Departments have been left to interpret the rules and regulations, or look towards a Variance process to assist developers and homeowners with finishing their projects.

ANALYSIS

The City Engineer has proposed the following language be added to the Code. In cases where walls exceed the permitted height, or there are additional risks to life or property damage if a wall were to fail, the City would like additional engineering be completed and approved as part of the public record. The additional risk analysis would clearly indicate who is liable in the case of a failure, and would help assure that future home owners understand what they are buying if they purchase a lot or home with a wall that represents a higher-than-average risk for failure.

The proposed ordinance reads as follows:

<p>8. Walls 8 feet in height or less should be designed and constructed according to standard design and construction practices, manufacturer recommendations and published design charts. Regardless of the height of a retaining wall, the building official or City Engineer may require stamped engineered plans if it is suspected that the retaining wall needs additional engineering due to design requirements or environmental conditions. This may also be true for areas with a high water table or poor soil conditions. Plans must be stamped by an engineer licensed in the state.</p> <p>9. Gravity rock walls and gravity block walls cannot exceed 6 feet in height. Gravity rock walls or gravity block walls can be tiered to create additional height (i.e. they must be spaced horizontally by the height of the tallest adjacent retaining wall).</p> <p>10. Mechanically stabilized earth (MSE) walls such as Keystone with geogrid or other tie-back systems are permitted. Reinforced concrete cantilevered retaining walls are also permitted. These walls may be tiered but any tier cannot exceed 8 feet in height.</p> <p>11. Rock or other coverings on a steepened slope (rockery) may be considered a retaining wall when the slope exceeds the maximum permanent cut or fill slope recommended by a geotechnical analysis. If a slope requires a rockery to be stable then it is to be treated as a retaining wall.</p> <p>12. If these requirements are more restrictive than the standards found elsewhere in the ordinance then these standards will apply.</p>	<p>Additional engineering may require a risk analysis if wall were to fail. Risk analysis to determine the potential loss of life or property damage. Performance of risk analysis requirement is at the discretion of the City Engineer and/or building official.</p>
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CONFORMANCE WITH THE GENERAL PLAN

There is nothing in the General Plan that was determined to pertain to this issue. Planning Department Staff is proposing this text amendment to Title 11 of City Code, at the request of the City Engineer and Building Official.

RECOMMENDATION

The Planning Department Staff recommends approval of this proposed text amendment, as a means of adjusting City Code to be responsive to retaining wall impacts and reducing the risk of loss of life or property.

EXHIBITS

None

Staff Report to the North Ogden City Planning Commission

SYNOPSIS / APPLICATION INFORMATION

Application Request: Consideration and action on a legislative amendment to update the Public Works Standards adopted by ordinance and referenced in North Ogden City Zoning Code Title 11

Agenda Date: September 7, 2022

Applicant: North Ogden City

File Number: ZTA 2022-10

PUBLIC NOTICE:

Mailed Notice: None

Newspaper:

City Website: August 22, 2022 (public hearing notice)

STAFF INFORMATION

Scott A. Hess
(801) 737-9841
shess@nogden.org

APPLICABLE ORDINANCES

Title 11 References to “Public Works Standards” throughout the Zoning Code

LEGISLATIVE DECISION

When the City is considering a legislative matter, the Planning Commission acts as a recommending body to the City Council. The City has wide discretion in taking legislative action. Examples of legislative actions are general plan, zoning map, and land use text amendments. Legislative actions require that the Planning Commission give a recommendation to the City Council. Typically the criteria for making a decision, related to a legislative matter, require compatibility with the general plan and existing codes.

BACKGROUND

Eric Casperson, City Engineer provided the following Staff Report information.

North Ogden City Public Works Standards Update August 2022

As things change, new processes and products become available and as new laws are created, it has become necessary to update the Public Works Standards. There have been a few changes, which I will highlight in the information below as well as in the Planning Commission meeting. Most of the Public Works Standards have not changed.

ANALYSIS

Some of the minor changes to the Public Works Standards include updating the right-of-way widths for minor roads (residential roads) and for major arterials. Another change is the addition of an “approved materials sheet” on the first sheet of each utility. This allows the contractors and developers to better see the products which North Ogden City uses and have approved. This has helped with decluttering the Standards.

Some of the more substantive additions and changes to the Public Works Standards are the addition of Low Impact Development (LID) Standards which will add clarity to City and State LID requirements for storm water management and water quality. The addition of the Sight Triangles Standards will help developers and contractors better plan for sight distance issues at our intersections which will result in safer intersections for pedestrians, bicyclists, and motorists. The Sight Triangle Standards, once adopted in the Public Works Standards, will conflict with Title 11. An update to Title 11 will be necessary to bring these two Codes into alignment. Finally, the updated Mountain Road cross section will standardize the cross section width and add consistency of design for a major thoroughfare through North Ogden City.

The Public Works Standards can be reviewed in Exhibit A. As previously noted, the majority of standards remain the same, and the individual updates are intended to add clarity, consistency, and standardization that will benefit the City as we continue to develop.

CONFORMANCE WITH THE GENERAL PLAN

North Ogden City’s General Plan is a combined effort and forward thinking document that requires Planning, Public Works, Building, Parks, and other City Departments to work together. While the Public Works Standards are not specifically called out in the General Plan, it is clear that the outcomes and desires that the Public Works Standards create ultimately inform the design and form of the City as it develops. One example is future roadways. The Public Works Standards are where road widths and designs are codified, and those planned facilities are highlighted in our Future Transportation Plans for the City. The DNA of the Public Works Standards are shown throughout the General Plan, and North Ogden City Staff, Planning Commission, and City Council do an excellent job of connecting the day to day decisions with the ultimate long range goals of the City.

RECOMMENDATION

The Planning Department Staff recommends approval of the Public Works Standards as presented.

EXHIBITS

Exhibit A: Draft Public Works Standards August 2022

Index of Drawings

ROADWAY (RD)

- RD-00 PUBLIC ROADS – APPROVED MATERIALS
- RD-01 PUBLIC ROADS – TYPICAL STREET SECTIONS
- RD-02 PUBLIC ROADS – TYPICAL DRIVE APPROACH DETAILS
- RD-03 PUBLIC ROADS – TYPICAL INTERSECTION DETAILS
- RD-03A PUBLIC ROADS – TYPICAL INTERSECTION DETAILS
- RD-04 PUBLIC ROADS – TYPICAL ADA RAMP & DEFECTIVE CONCRETE REPLACEMENT DETAILS
- RD-05 PUBLIC ROADS – CUL-DE-SAC & TEMP. TURNAROUND DETAILS
- RD-06 PUBLIC ROADS – TYPICAL SIGHT TRIANGLES
- RD-07 PUBLIC ROADS – STREETScape STANDARDS
- RD-08 PUBLIC ROADS – STREETScape STANDARDS

CULINARY WATER (CW)

- CW-00 CULINARY WATER – APPROVED MATERIALS
- CW-01 CULINARY WATER – RESIDENTIAL WATER SERVICE, 1 1/2" & 2" METER STATION, & PIPE TRENCH DETAILS
- CW-02 CULINARY WATER – THRUST BLOCK, WATERLINE LOOP, FLUSH VALVE, & FIRE HYDRANT DETAILS
- CW-03 CULINARY WATER – TRACING WIRE INSTALLATION DETAILS
- CW-04 CULINARY WATER – 3", 4", 6" WATER METER STATIONS & AIR/VACUUM RELIEF STATION DETAILS
- CW-05 CULINARY WATER – PRESSURE REDUCTION STATION
- CW-06 CULINARY WATER – PRESSURE RELIEF VALVE

SANITARY SEWER (SS)

- SS-00 SANITARY SEWER – APPROVED MATERIALS
- SS-01 SANITARY SEWER – LATERAL & CONNECTION DETAILS
- SS-02 SANITARY SEWER – TYPICAL MANHOLES & DETAILS

STORM DRAIN (SD)

- SD-00 STORM DRAIN – APPROVED MATERIALS
- SD-01 STORM DRAIN – SINGLE AND DOUBLE CATCH BASIN DETAILS
- SD-02 STORM DRAIN – DRAINAGE DITCH INLET BOX, GENERAL GRATE AND FRAME, & SUBSURFACE DRAIN DETAILS
- SD-03 STORM DRAIN – CONTROL STRUCTURE DETAILS
- SD-04 STORM DRAIN – MANHOLE DETAILS
- SD-05 STORM WATER POLLUTION PREVENTION PLAN DETAILS

LANDSCAPE AND GRADING (LS)

- LS-00 LANDSCAPE – APPROVED MATERIALS
- LS-01 LANDSCAPE (DETENTION BASINS) & ASPHALT/CONCRETE TRAIL DETAILS
- LS-02 IRRIGATION DETAILS
- LS-03 L.I.D. NOTES, GRADING AND RETAINING WALLS

FENCING (FC)

- FC-01 CHAIN LINK FENCE DETAILS

LIGHTING (LT)

- LT-00 STREET LIGHTING STANDARDS – APPROVED MATERIALS
- LT-01 STREET LIGHTING STANDARDS – GENERAL LIGHTING
- LT-02 STREET LIGHTING STANDARDS – DECORATIVE LIGHTS

LOW IMPACT DEVELOPMENT (LID)

- LID-01 WET SWALES
- LID-01A WET SWALES
- LID-02 GENERAL – LID (LOW IMPACT DEVELOPMENT) EXAMPLES
- LID-03 DRY SWALES
- LID-03A DRY SWALES
- LID-04 GENERIC INFILTRATION GALLERIES
- LID-04A GENERIC INFILTRATION GALLERIES
- LID-05 RAIN GARDEN
- LID-05A RAIN GARDEN
- LID-06 PERMEABLE PAVERS
- LID-06A PERMEABLE PAVERS
- LID-07 PERMANENT INLET FILTRATION DEVICES
- LID-07A PERMANENT INLET FILTRATION DEVICES
- LID-08 HYDRODYNAMIC SEPARATORS
- LID-09 OUTLET SKIMMERS
- LID-09A OUTLET SKIMMERS
- LID-10 PARTICULATE FILTRATION SYSTEMS
- LID-11 MAP OF SENSITIVE AND PROTECTED AREAS
- LID-12 SENSITIVE AND PROTECTED AREAS – WELL 1
- LID-13 SENSITIVE AND PROTECTED AREAS – WELL 2
- LID-14 SENSITIVE AND PROTECTED AREAS – WELL 3
- LID-15 SENSITIVE AND PROTECTED AREAS – LAKEVIEW HEIGHTS WELL

RECORD OF REVISIONS

7.

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	5/16/2022

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NORTH OGDEN CITY CORPORATION

PUBLIC WORKS STANDARDS

SHEET INDEX

PROJECT NUMBER	2020-0125	
SHEET	02	OF 58
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ROADWAY STANDARD DRAWINGS - APPROVED MATERIALS

ROADWAY		
PART	APPROVED MATERIAL	STANDARD DRAWING
DETECTABLE WARNING SURFACE	ADA SOLUTION, INC. 24481DPAV2	RD-04

ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER.

NO.	DATE	DESCRIPTION

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 9/1/2022

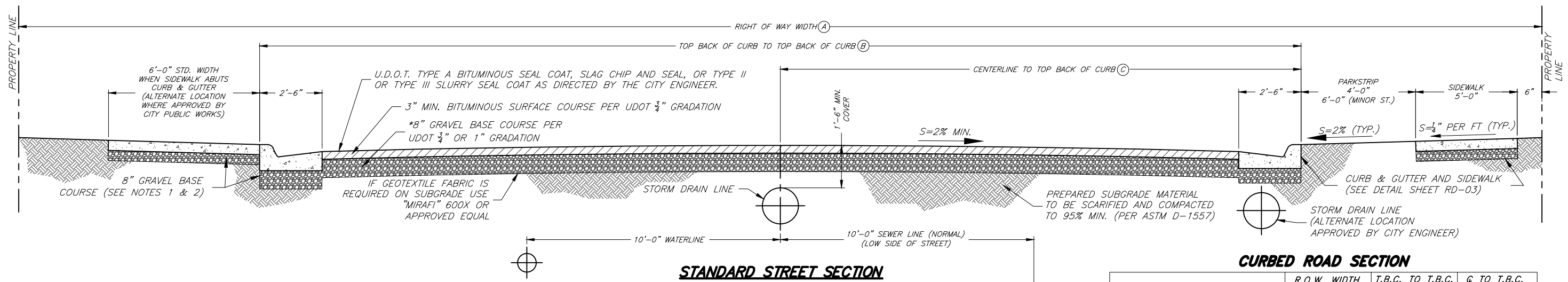


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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
PUBLIC ROADS - APPROVED MATERIALS

PROJECT NUMBER 2020-0125
SHEET 03 OF 58
SHEET NUMBER RD-0



STANDARD STREET SECTION

CURBED ROAD SECTION

STREET DESIGNATION	R.O.W. WIDTH A	T.B.C. TO T.B.C. B	CL TO T.B.C. C
*MINOR (STANDARD RESIDENTIAL)	60'	37'	18.5'
COLLECTOR	66'	47'	23.5'
MINOR ARTERIAL	80'	61'	30.5'
MAJOR ARTERIAL	100'	81'	40.5'

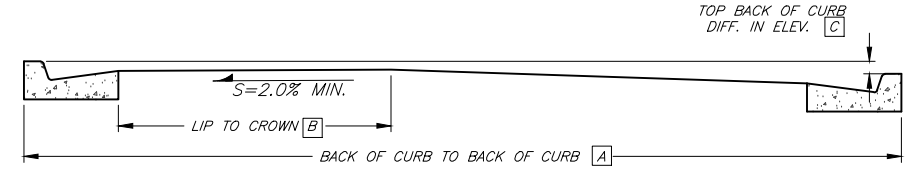
- NOTE:
- *LESS THAN 1000 VEHICLE TRIPS PER DAY.
 - ALL OTHER PROPOSED STREE CROSS SECTIONS SHALL BE AS APPROVED BY THE NORTH OGDEN CITY ENGINEER.
 - ROAD SECTION USED AS DETERMINED BY THE CITY ENGINEER & PLANNING COMMISSION BASED UPON ZONING, GENERAL PLAN, SIZE OF DEVELOPMENT, ESTIMATED TRAFFIC VOLUME & AMOUNT OF OPEN SPACE ASSOCIATED WITH DEVELOPMENTS PROXIMITY TO HIGH VOLUME ROADS OR COMMERCIAL ZONING.

STREET SECTION NOTES:

- PROVIDE 4" THICKNESS OF 3/4" OR 1" GRAVEL BASE COURSE UNDER SIDEWALK.
- PROVIDE 8" THICKNESS OF 3/4" OR 1" GRAVEL BASE COURSE UNDER DRIVEWAY APPROACHES AND CURB & GUTTER
- *THESE PAVEMENT THICKNESS SHALL BE CONSIDERED AS CITY STANDARDS AND MAY BE INCREASED BY THE CITY ENGINEER WHEN A GREATER DEPTH IS NECESSARY TO PROVIDE SUFFICIENT STABILITY. DESIGNER AND/OR DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT DESIGN BASED ON A DETAILED SOILS ANALYSIS AND T.I. (TRAFFIC INDEX), FOR APPROVAL BY THE CITY ENGINEER WHICH MAY MODIFY STRUCTURAL SECTION, BUT IN NO CASE SHALL THE BITUMINOUS SURFACE COURSE BE LESS THAN 3" AND GRAVEL BASE COURSE LESS THAN 8" THICK.
- SCORE CONCRETE SIDEWALK TRANSVERSELY AT A SPACING EQUAL TO THE SIDEWALK WIDTH AND ONE FOURTH OF CONCRETE THICKNESS FOR CONTRACTION JOINTS. MAXIMUM SPACING SHALL NOT EXCEED TEN FEET.
- PROVIDE 1/2" EXPANSION MATERIAL AT 60' INTERVALS AND AT ALL EDGES WHERE SIDEWALKS ABUT DRIVEWAYS. EXPANSION MATERIAL TO EXTEND THE ENTIRE THICKNESS OF THE CONCRETE.
- IN NEW SUBDIVISIONS WHERE FUTURE DRIVEWAY LOCATIONS ARE UNKNOWN, THE DRIVEWAY APPROACH SHALL BE MADE BY SAW CUTTING THE BACK OF THE EXISTING CURB TO THE REQUIRED DRIVEWAY WIDTH. ALL SAW CUTTING SHALL BE ACCOMPLISHED BY A CITY APPROVED LICENSED CONTRACTOR.
- SIDEWALK ADJACENT TO DRIVE APPROACHES MUST BE 6" MINIMUM THICKNESS THROUGH THE DRIVEWAY WIDTH.
- IF THE SIDEWALK HAS BEEN PREVIOUSLY INSTALLED WHEN THE NEW DRIVEWAY IS CONSTRUCTED, THE 4" THICK SIDEWALK AND GRAVEL BASE SHALL BE REMOVED AND REPLACED WITH 6" THICK SIDEWALK AND 8" THICK GRAVEL BASE THROUGH THE NEW APPROACH, AT THE OWNERS OR DEVELOPERS EXPENSE.
- PARK-STRIPS: IN ORDER TO ACCOMMODATE UTILITY MAINTENANCE, REPAIR, CONSTRUCTION OR REPLACEMENT HARD SURFACING SUCH AS CONCRETE, ASPHALT, OR ROCK/STONE/MASONRY PAVERS ARE NOT ALLOWED IN PARK-STRIP AREAS. ANY PROTECTIVE COVERING IN THE PARK-STRIP MUST BE LIMITED TO MATERIALS SUCH AS BARK, DECORATIVE ROCK, SOD, FLOWERS OR OTHER LOW GROWING PLANTS AND SHRUBBERY COMMONLY USED FOR LANDSCAPING. HARD SURFACING MATERIAL MAY BE ALLOWED AFTER CONSIDERATION OF SPECIAL CONDITIONS AND ONLY WHEN APPROVED BY THE CITY. TREE PLANTING IN THE PARK-STRIP SHALL BE AS REGULATED BY CITY ORDINANCE.
- ALL CULINARY WATER MAINS AND SERVICES MUST MAINTAIN A MINIMUM SEPARATION FROM ALL SEWER MAINS AND LATERALS OF 10'-0" HORIZONTAL AND 18" VERTICALLY ABOVE IN ACCORDANCE WITH THE STATE OF UTAH DIVISION OF DRINKING WATER RULES SECTION R309-550-7
- NATURAL GAS TYPICALLY LOCATED IN THE PARKSTRIP, POWER AND COMMUNICATION LINES TYPICALLY LOCATED BEHIND PROPERTY LINES OR IN LOT EASEMENTS.

STREET CUTS AND POT-HOLE LOCATION ACTIVITIES

- WHEN AN EXISTING ROADWAY IS CUT FOR THE LOCATION OR INSTALLATION OF UTILITY LINES THE PAVEMENT SHALL BE REPLACED WITH A T-PATCH AS SHOWN ON THE TYPICAL TRENCH SECTION ON SHEET CW-01 OF THESE STANDARDS. WHERE MECHANICAL COMPACTION EQUIPMENT CANNOT BE USED TO CONSOLIDATE BACKFILL SUCH AS IN VACTOR POT-HOLE LOCATION PROCEDURES, THE HOLE SHALL BE FILLED WILL FLOWABLE FILL. THE PAVEMENT SHALL BE SAW CUT ONE FOOT BEYOND THE POT-HOLE AND PATCHED INCLUDING A TACK COAT ON ALL EDGES. THE MINIMUM SIZE OF PATCH SHALL BE TWO FEET BY TWO FEET. IF A PATCH IS LOCATED WITHIN TWO FEET OF THE LIP OF GUTTER OR EDGE OF ASPHALT THE PATCH SHALL BE EXTENDED TO THE LIP OF GUTTER OR EDGE OF ASPHALT.



CROWN NOTES:

- MAXIMUM DIFFERENCE IN ELEVATION BETWEEN CURBS ON OPPOSITE SIDES OF THE STREET SHALL NOT EXCEED THOSE SHOWN IN DETAIL AND TABLE.
- ON ARTERIAL STREETS AND CERTAIN STREETS APPROVED BY THE CITY COUNCIL, THE CITY ENGINEER WILL PROVIDE A PAVEMENT DESIGN.
- LOCATION OF SIDEWALK AND CURB & GUTTER MAY VARY ON INDIVIDUAL ARTERIAL STREETS PER DIRECTION OF THE CITY ENGINEER.

CROWN LOCATION TABLE		
A	B	C
41'-0"	16'-0"	0'-0"
41'-0"	10'-0"	0'-6"
41'-0"	8'-0"	1'-0"
47'-0"	21'-0"	0'-0"
47'-0"	10'-6"	0'-6"
47'-0"	10'-6"	1'-0"

CROWN LOCATION FOR VARIOUS CROSS SLOPES

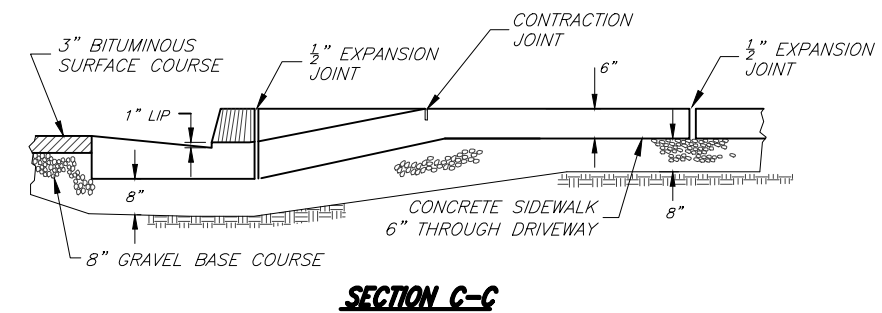
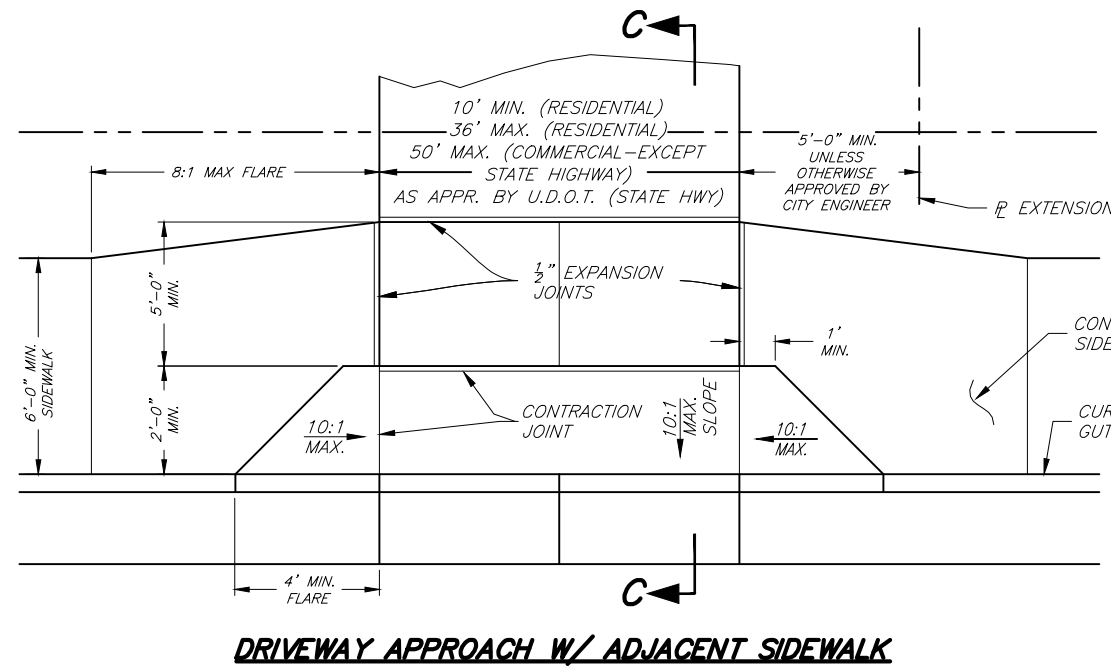
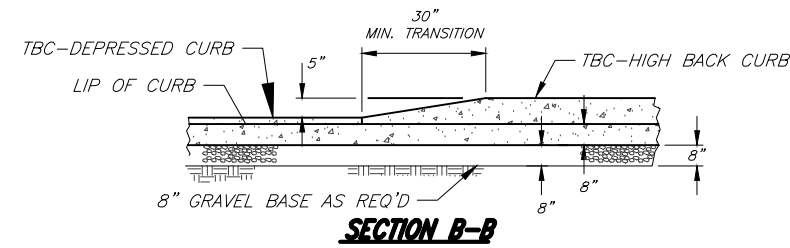
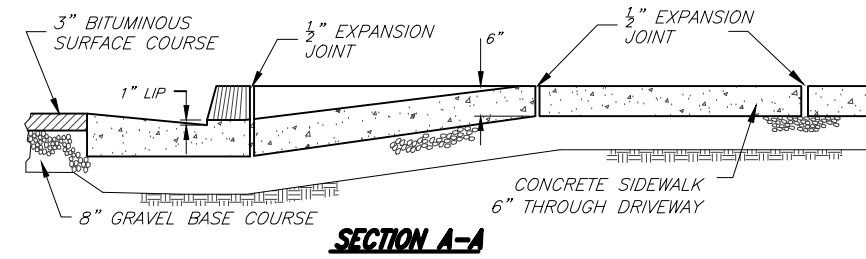
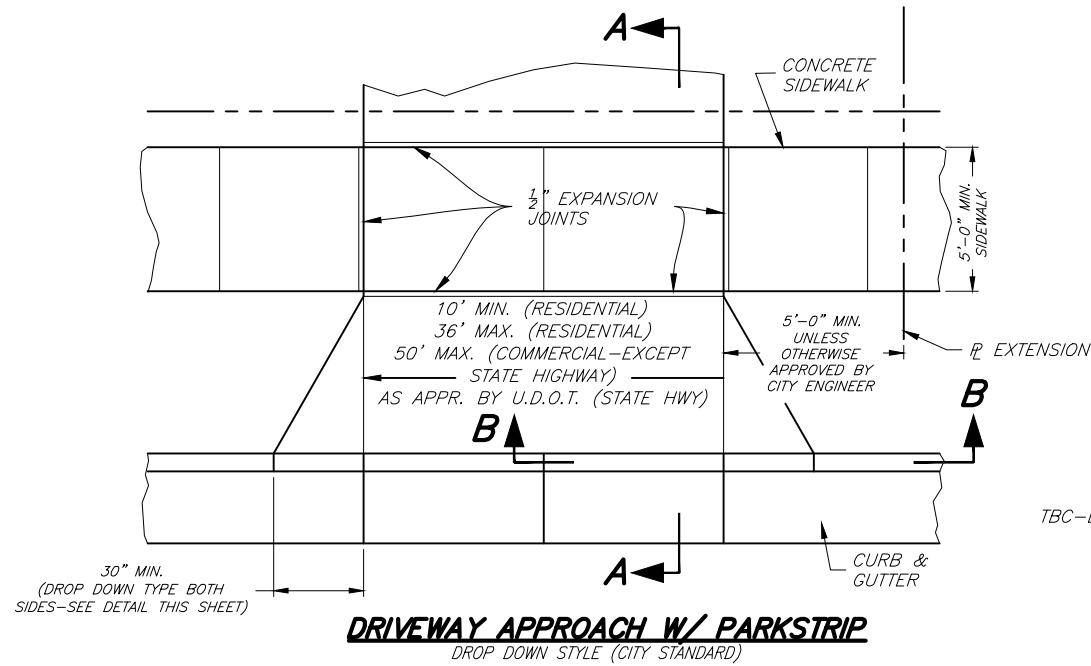
NO.	DATE	DESCRIPTION

PRINCIPAL M. CHANDLER PROJECT MANAGER A. THOMPSON CHECKED BY A. THOMPSON DRAWN BY O. CURTIS DRAWING SCALE 1" = 2' ISSUE DATE 3/28/2022

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NORTH OGDEN CITY CORPORATION
 PUBLIC WORKS STANDARDS
 PUBLIC ROADS - TYPICAL STREET SECTIONS

PROJECT NUMBER
 2020-0125
 SHEET
 04 OF 58
 SHEET NUMBER
 RD-058
 Page 19



NO.	DESCRIPTION	DATE

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
PUBLIC ROADS - TYPICAL DRIVE APPROACH DETAILS

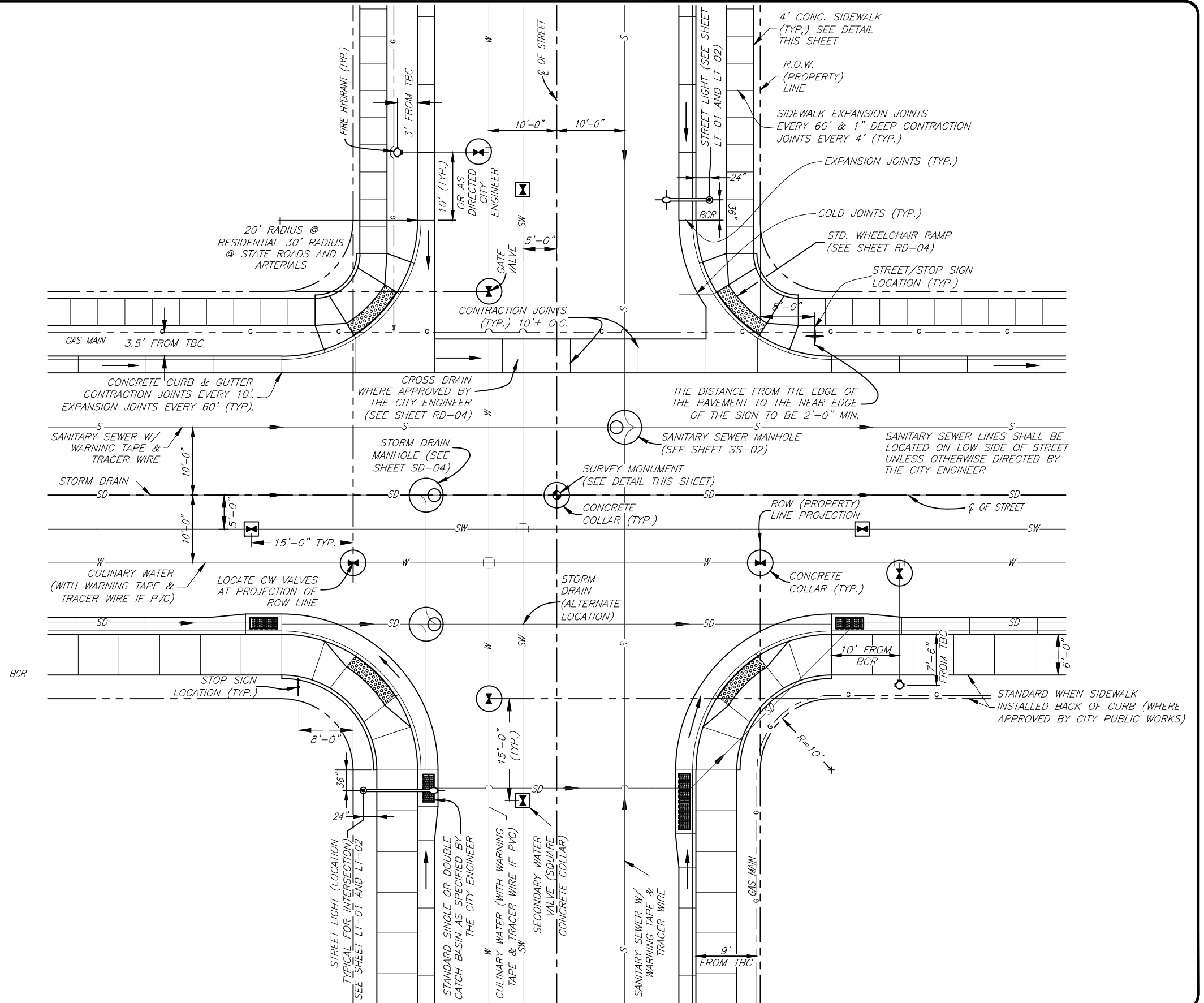
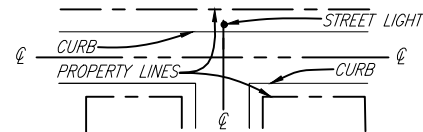
PROJECT NUMBER 2020-0125	
SHEET 05	OF 58
SHEET NUMBER RD-0	

STREET NOTES:

- ① PRESSURIZED IRRIGATION SYSTEM DESIGN AS APPROVED BY PINEVIEW OR MOUNTAIN VIEW IRRIGATION.
- ② THE NUMBER OF VALVES REQUIRED AT EACH INTERSECTION SHALL BE DETERMINED BY THE CITY WATER DEPARTMENT.
- ③ EXACT LOCATION OF STREET AND REGULATORY SIGNS SHALL BE SPECIFIED BY THE CITY ENGINEER FOR SPECIFIC INTERSECTIONS.
- ④ SIGNS TO BE INSTALLED AND PAID FOR BY THE DEVELOPER.
- ⑤ CITY UTILITY LINES MUST BE LOCATED IN A PUBLIC RIGHT-OF-WAY. NO CITY UTILITIES MAY BE CONSTRUCTED ON PRIVATE PROPERTY. ANY UTILITY LINES MAINTAINED BY THE CITY MUST ALSO BE IN A PUBLIC RIGHT-OF-WAY.
- ⑥ ON LOCAL STREETS WHERE THE PARK STRIPS ARE UTILIZED, FOR L.I.D. DRY UTILITIES SHALL BE LOCATED IN A 15' PUE BEHIND THE PROPERTY LINE

STREET LIGHTING:

- A. WHEN LOCATING STREET LIGHTING ALWAYS INSTALL ASS'Y WITH MAST ARM AT RIGHT ANGLES TO STREET.
- B. ALWAYS LOCATE STREET LIGHT IN CLOSE PROXIMITY TO STREET SIGN.
- C. T INTERSECTION SHALL BE LIT WITH LIGHT ASSEMBLY LOCATED OPPOSITE OF CENTERLINE OF INTERSECTING STREET. (SEE DIAGRAM BELOW)
- D. PLACE STREET LIGHT AT PROPERTY LINES, EXCEPT NEAR INTERSECTIONS; AVOID FUTURE DRIVEWAY CONFLICTS.
- E. SEE SHEET LT-01 AND LT-02 FOR STREET LIGHT DETAILS



NO.	DESCRIPTION	DATE

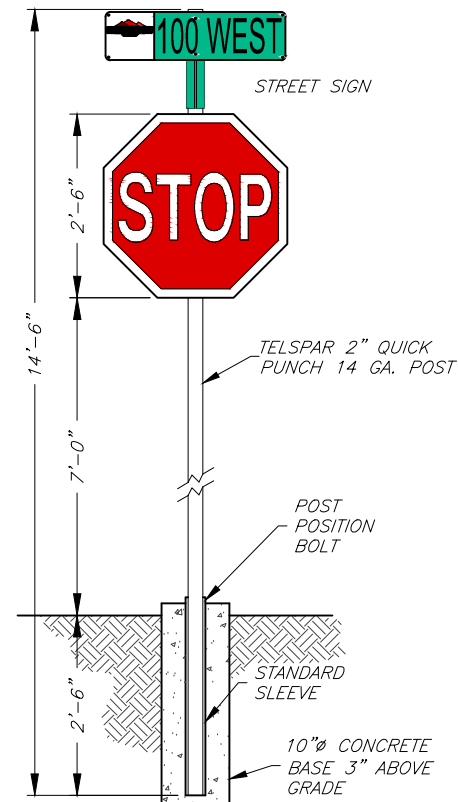
PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
PUBLIC ROADS - TYPICAL INTERSECTION DETAILS

PROJECT NUMBER 2020-0125	
SHEET 06	OF 58
SHEET NUMBER RD-06	

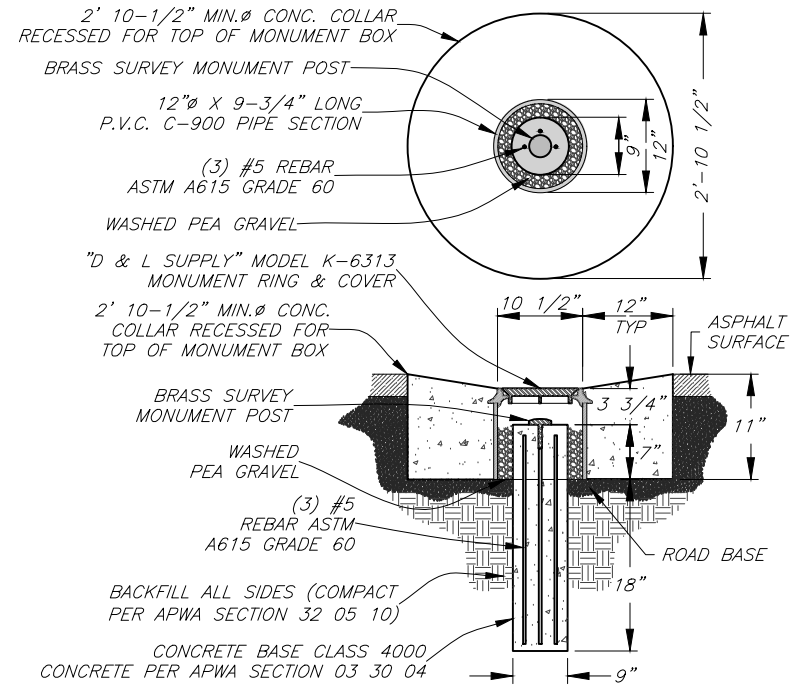
ALL SIGNS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES"



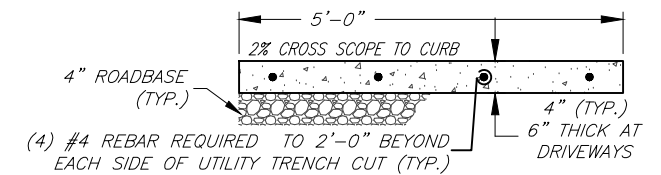
STREET / TRAFFIC SIGN & POST

STREET SIGN NOTES:

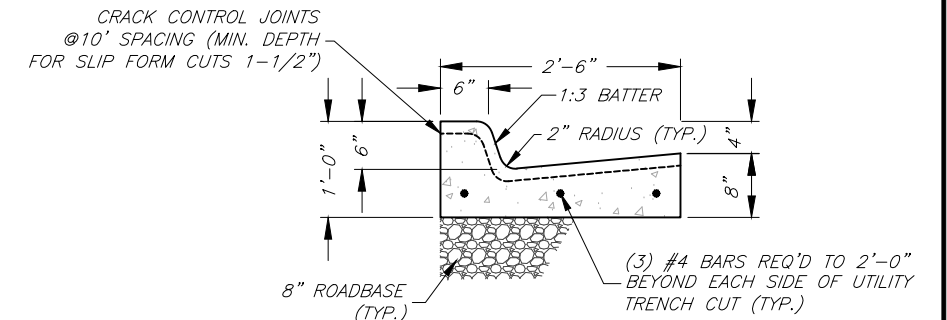
1. BACKGROUND SHALL BE GREEN, HIGH INTENSITY REFLECTIVE SHEETING 9FP-85 TYPE IIIA)
2. LEGEND SHALL BE WHITE LETTERS, HIGH INTENSITY REFLECTIVE SHEETING 9FP-85 IIIA)
3. SIGN BLANK SHALL BE 6081-T6 HEAT TREATED HIGH TENSILE DEGREASED ALUMINUM W/ALODINE 1200 FINISH-THICKNESS SHALL BE 0.08"
4. EACH SIGN SHALL CONSIST OF TWO PLATES RIVETED TOGETHER & MOUNTED AS SHOWN
5. SIGN ON PRIVATE ROADS SHALL MEET ALL SPECIFICATIONS FOR STANDARD SIGNS, EXCEPT BACKGROUND SHALL BE BLUE
6. ALL STREETS WITH NAMES MUST ALSO SHOW LOCATIONS COORDINATE DESIGNATION
7. CITY ENGINEER MUST BE CONTACTED PRIOR TO MAKING SIGNS TO VERIFY PROPER NAMES AND COORDINATES



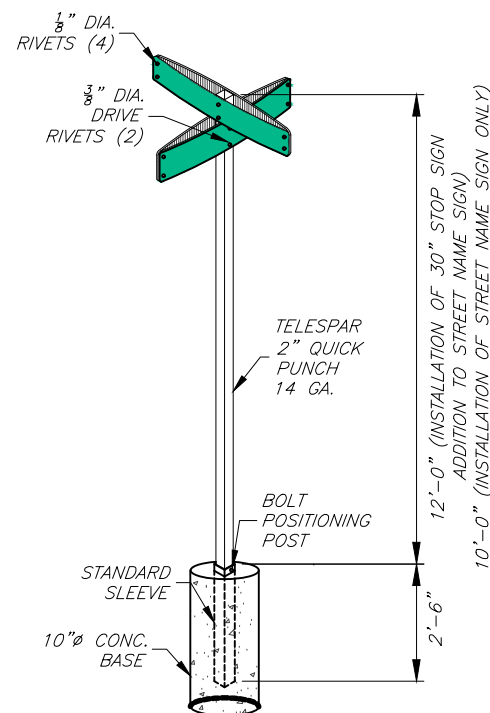
SURVEY MONUMENT DETAIL



SIDEWALK SECTION (CITY STANDARD)



CURB & GUTTER SECTION (CITY STANDARD)



STREET SIGN & POST

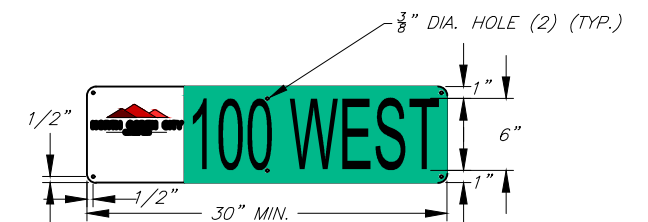
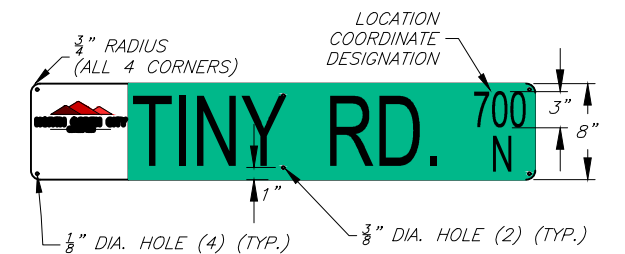


PLATE DETAIL

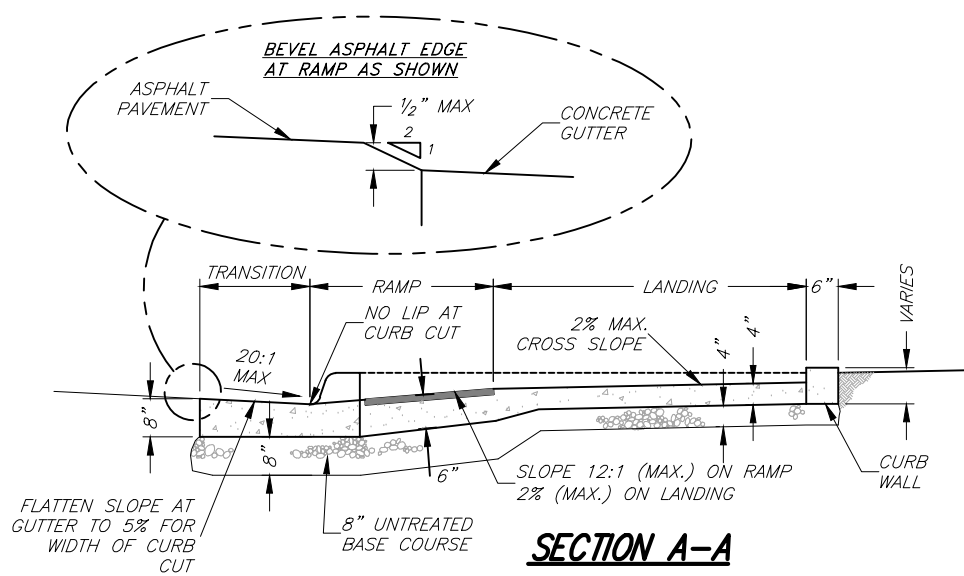
NO.	REVISION	DATE

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
PUBLIC ROADS - TYPICAL INTERSECTION DETAILS

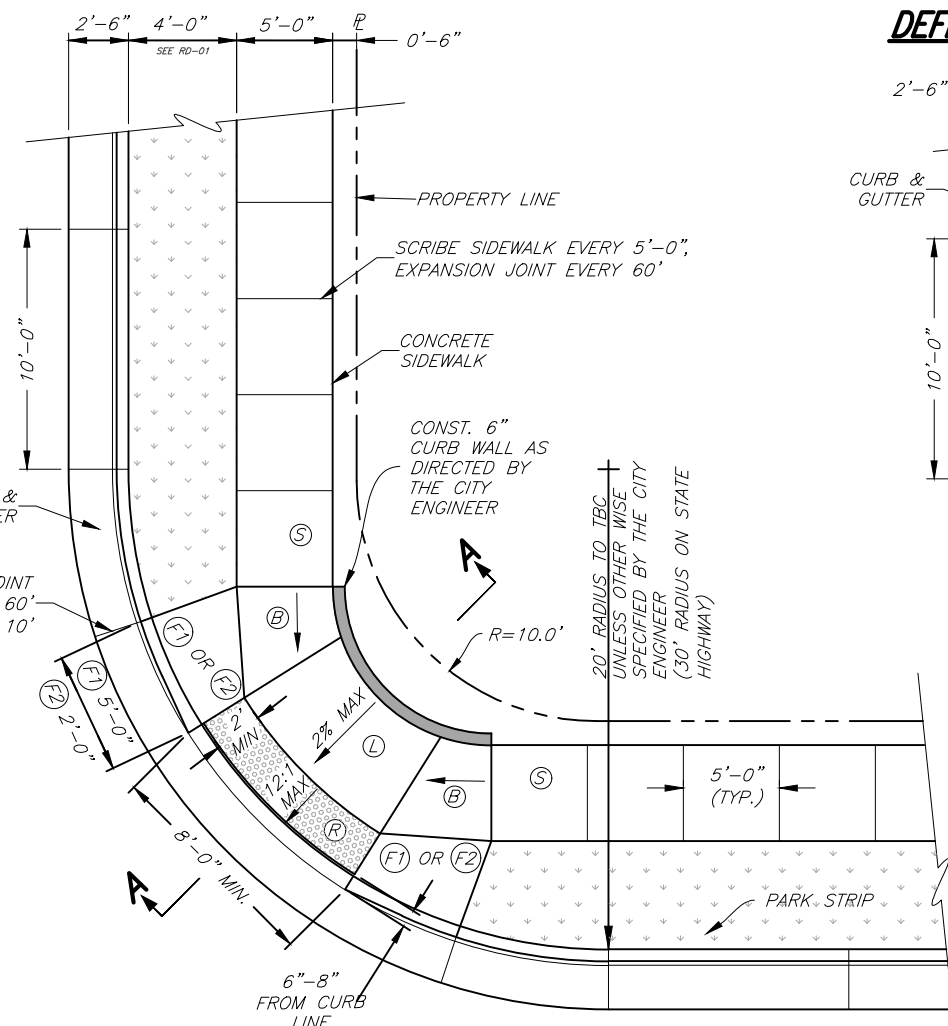
PROJECT NUMBER	2020-0125
SHEET	07 OF 58
SHEET NUMBER	RD-0



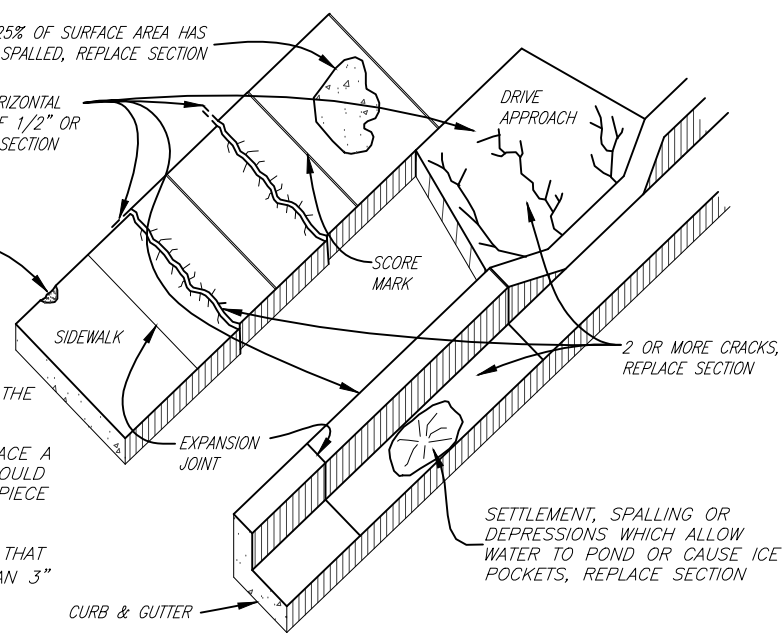
- ADA RAMP NOTES:**
- WHERE DESIGNATED BY THE CITY, ALTERNATE RAMP DESIGNS MAY BE USED. SUBMIT ENGINEERED CONSTRUCTION PLANS TO CITY ENGINEER AND THE CITY PUBLIC WORKS DEPARTMENT FOR REVIEW AND ACCEPTANCE PRIOR TO CONSTRUCTION.
 - USE THE SLOPE TABLE BELOW FOR RAMP CONSTRUCTION. THE USE OF FLARES, CURB WALLS, ETC. ARE AT THE DISCRETION OF THE CITY ENGINEER.
 - LOCATE CURB CUT WITHIN CROSSWALK.
 - RAMP GRADE BREAK MUST BE PERPENDICULAR TO THE RUNNING SLOPE.

SLOPE TABLE			
	ITEM	MAX. RUNNING SLOPE*	MAX. CROSS SLOPE*
Ⓛ	LANDING	2% (1V:48H)	2% (1V:48H)
Ⓡ	RAMP	8.33% (1V:12H)	2% (1V:48H)
Ⓢ	SIDEWALK	--	2% (1V:48H)
Ⓣ1	TRAVERSABLE SURFACE	10% (1V:10H)	--
Ⓣ2	NON-TRAVERSABLE SURFACE	25% (1V:4H)	--
Ⓟ	BLENDED TRANSITION	5% (1V:20H) 2% MIN.	2% (1V:48H)

* RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL. CROSS SLOPE IS PERPENDICULAR TO PEDESTRIAN TRAVEL.

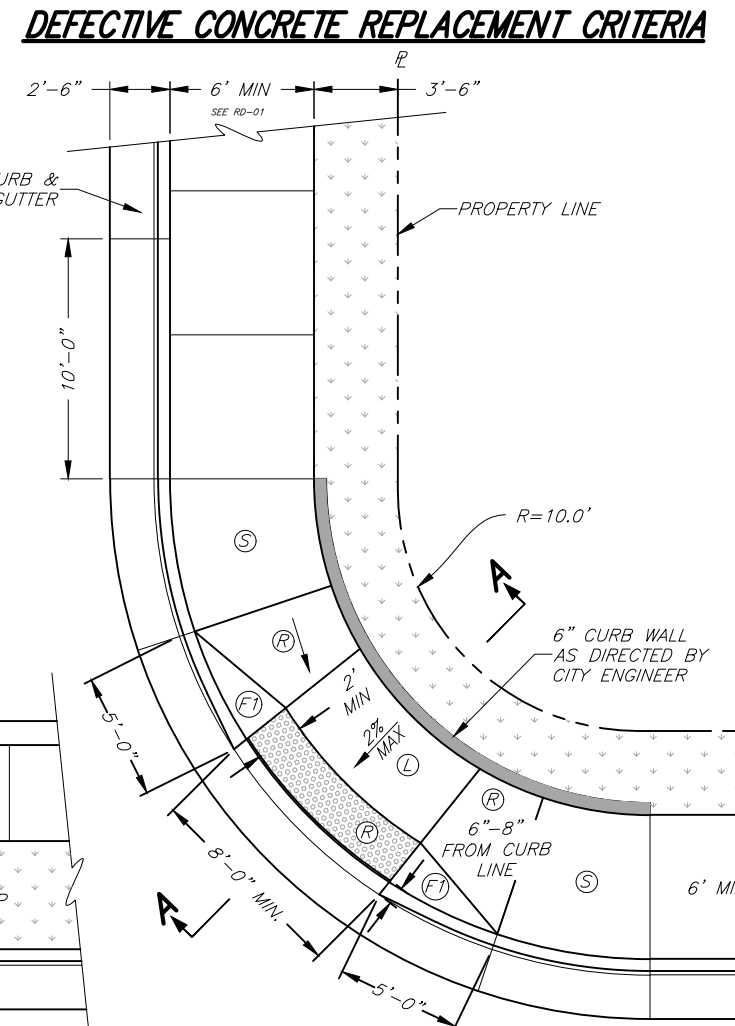


WHEEL CHAIR RAMP DETAIL "A"
CITY STANDARD (WITH PARK STRIP)

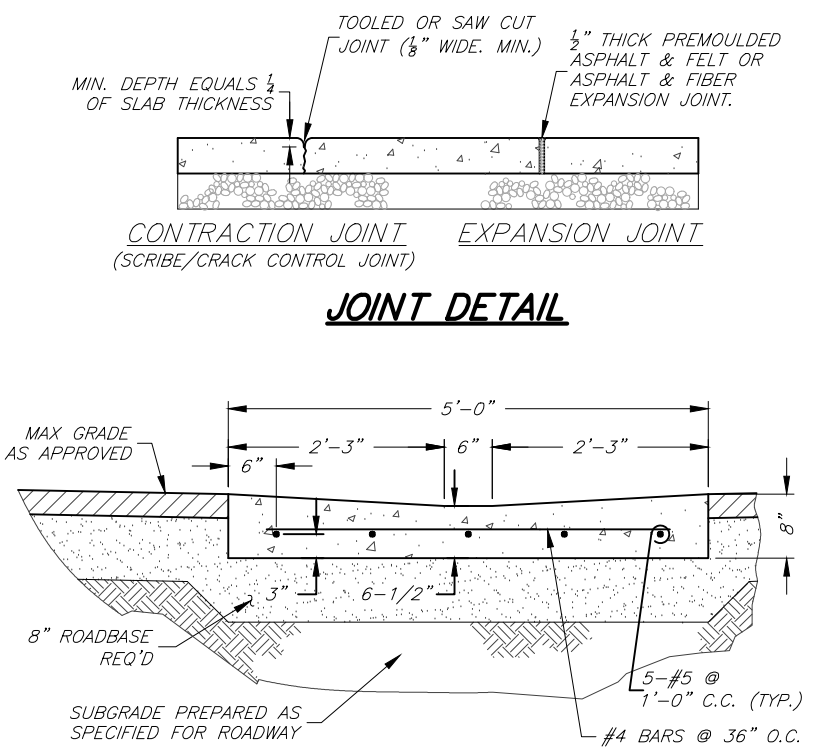


REPLACE SECTION IF THE NUMBER OF CHIPS EXCEEDS TWO PER 10' OR FIVE PER 100' OR THE CHIP DEPTH EXCEEDS 1/2"

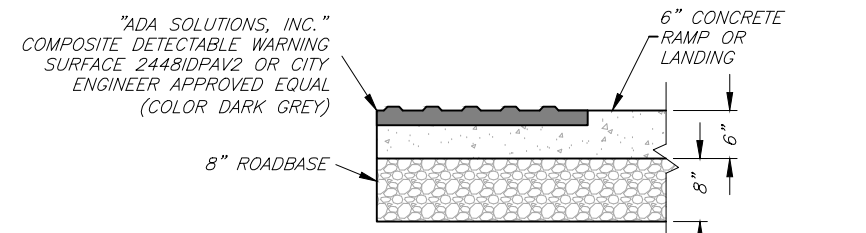
- CONCRETE REPLACEMENT NOTES:**
- REPLACEMENT IS REQUIRED IF ANY COMPONENT HAS ONE OR MORE OF THE CONDITIONS SHOWN.
 - ANYTIME CONCRETE IS CUT TO REPLACE A DEFECTIVE COMPONENT, THE CUT SHOULD EXTEND COMPLETELY THROUGH THE PIECE BEING REPLACED.
 - A CHIP IS CONCRETE EDGE DAMAGE THAT IS DEEPER THAN 1/4" AND LARGER THAN 3" DIA.



WHEELCHAIR RAMP DETAIL "B"
REQUIRES WRITTEN CITY APPROVAL (WITHOUT PARK STRIP)



CROSS DRAIN SECTION
(WHERE APPROVED BY CITY PUBLIC WORKS DIRECTOR AND THE CITY ENGINEER)



DETECTABLE WARNING SURFACE DETAIL

- DETECTABLE WARNING SURFACE NOTES:**
- LOCATE DETECTABLE WARNING SURFACE SO THAT THE EDGE NEAREST THE CURB LINE OR OTHER POTENTIAL HAZARD IS 6 TO 8 INCHES FROM THE CURB LINE OR OTHER POTENTIAL HAZARD. PROVIDE 2-FOOT MINIMUM DEPTH.
 - PROVIDE DETECTABLE WARNING SURFACE FOR FULL WIDTH OF CURB CUT.
 - THE DETECTABLE WARNING SURFACE DOMES SHALL BE ORIENTED SUCH THAT THE ROWS ARE PARALLEL WITH THE DIRECTION OF PEDESTRIAN TRAVEL TO THE RAMP ON THE OPPOSITE SIDE OF THE STREET.
 - THE STANDARD COLOR FOR THE DETECTABLE WARNING SURFACE SHALL BE DARK GRAY OR PRE-APPROVED CONTRASTING COLOR. WHEN THE EXISTING SIDEWALK COLOR IS NOT STANDARD CONCRETE, THE COLOR OF THE DETECTABLE WARNING SURFACE SHALL BE DETERMINED BY THE CITY ENGINEER OR AUTHORIZED REPRESENTATIVE.
 - WHEN A DETECTABLE WARNING SURFACE DOME IS CUT, THE REMAINING PORTION OF THE DOME SHALL BE BEVELED TO A MAXIMUM SLOPE OF 1:2.

REVISION	DATE	BY	CHKD

PROJECT NUMBER	2020-0125
SHEET	08 OF 58
SHEET NUMBER	RD-01
DATE	8/31/2022

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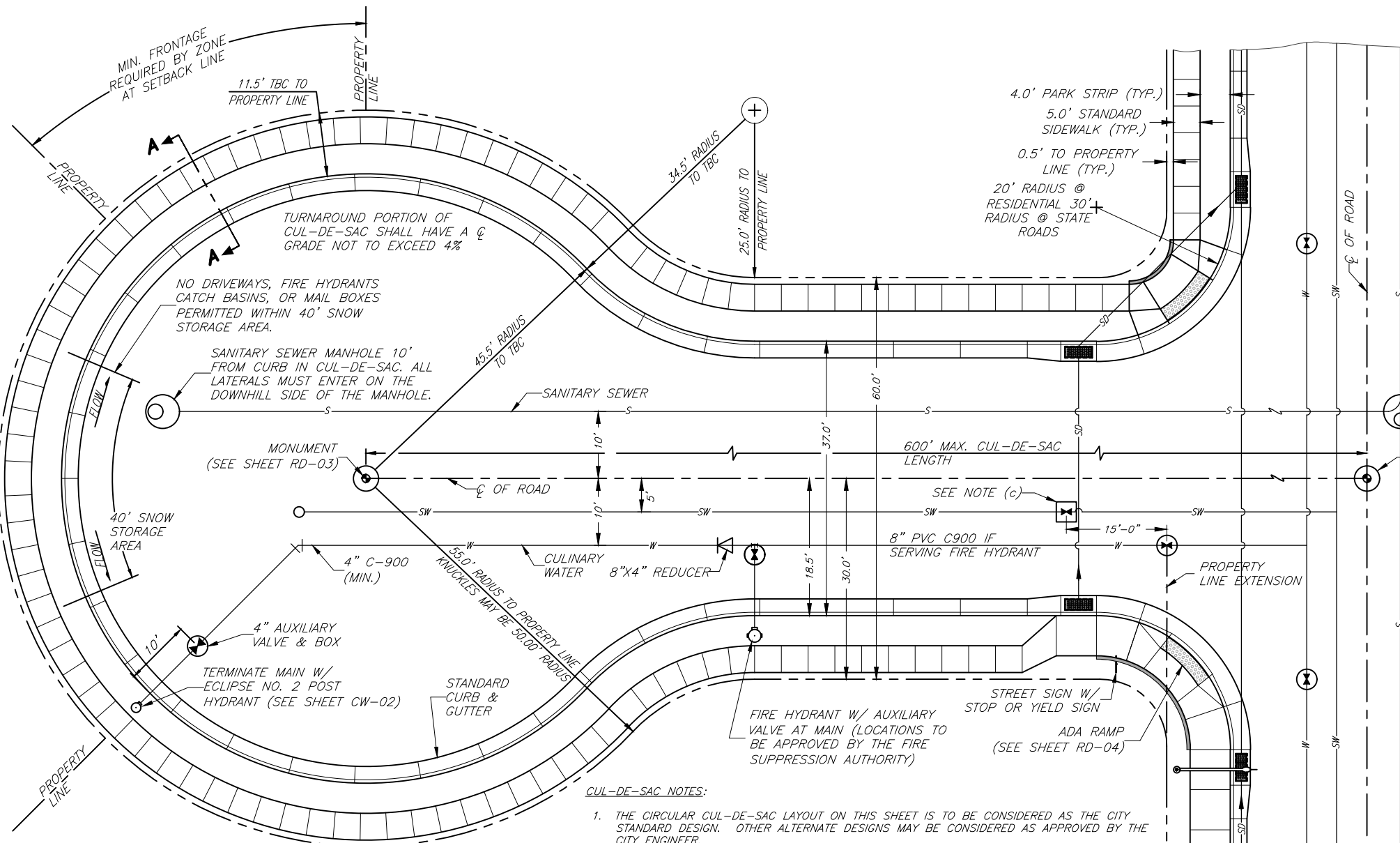
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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
PUBLIC ROADS - TYPICAL ADA RAMP & DEFECTIVE CONCRETE REPLACEMENT DETAILS

7.

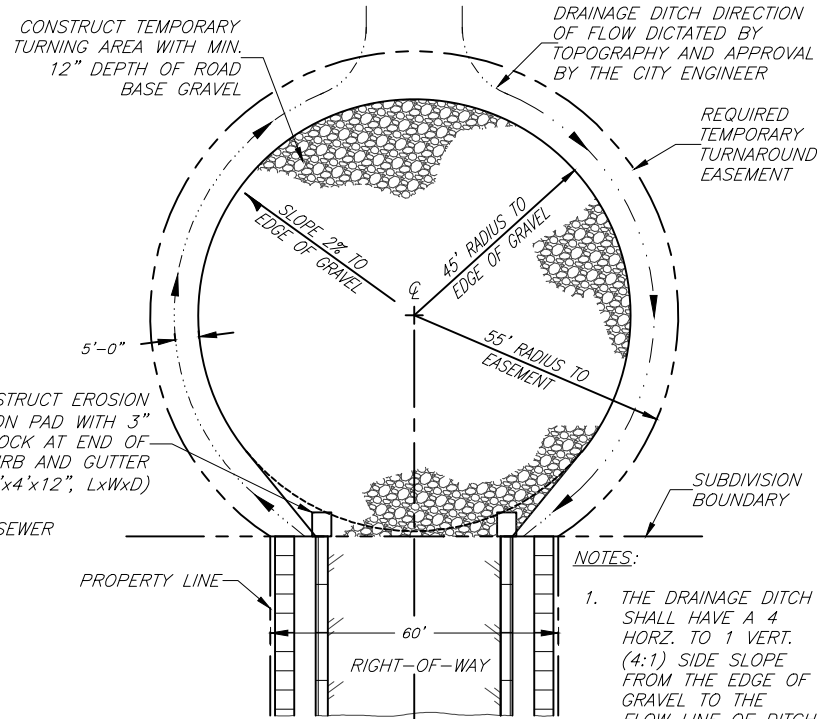
RD-01

Page 23



CUL-DE-SAC
60' RIGHT-OF-WAY

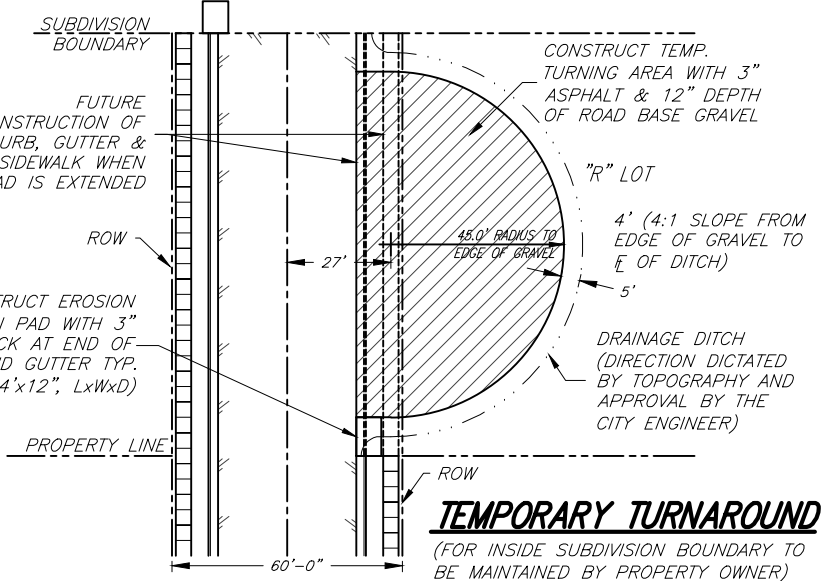
- CUL-DE-SAC NOTES:**
1. THE CIRCULAR CUL-DE-SAC LAYOUT ON THIS SHEET IS TO BE CONSIDERED AS THE CITY STANDARD DESIGN. OTHER ALTERNATE DESIGNS MAY BE CONSIDERED AS APPROVED BY THE CITY ENGINEER.
 2. DEVELOPER SHALL PROVIDE AN AIR RELIEF OR BLOW-OFF ASSEMBLY AS DETERMINED BY THE SECONDARY WATER PROVIDER AND IN ACCORDANCE WITH THEIR STANDARDS. CITY ENGINEER TO APPROVE THE LOCATION OF BLOW-OFFS IN THE FIELD SHOULD THERE BE A CONFLICT WITH OTHER UTILITIES.
 3. ALL TERMINATING SEWER MAINS SHALL END WITH A CITY STANDARD MANHOLE.
 4. SERVICE LATERAL CONNECTIONS SHALL NOT BE ALLOWED IN SEWER MANHOLES.



TEMPORARY TURNAROUND

(FOR OUTSIDE OF SUBDIVISION BOUNDARY AND TO BE MAINTAINED BY PROPERTY OWNER)

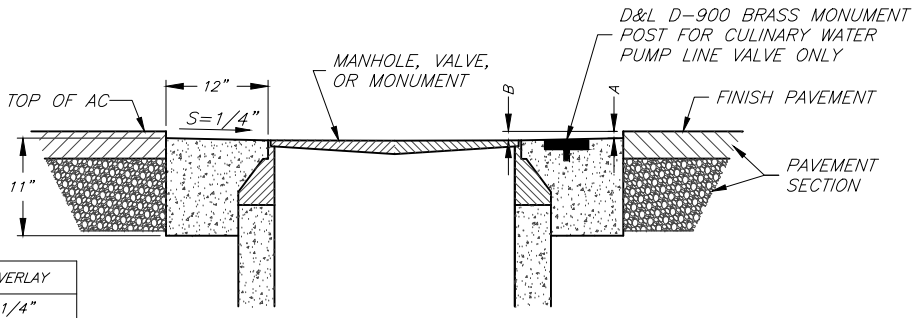
- NOTES:**
1. THE DRAINAGE DITCH SHALL HAVE A 4 HORIZ. TO 1 VERT. (4:1) SIDE SLOPE FROM THE EDGE OF GRAVEL TO THE FLOW LINE OF DITCH.
 2. DRAINAGE DITCH MUST HAVE A MIN. GRADE OF 0.5%



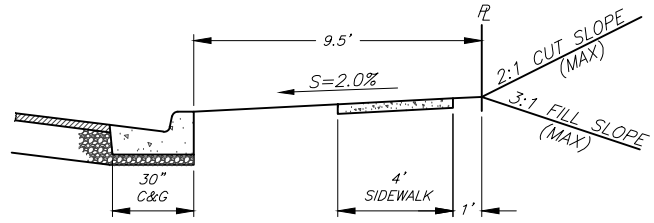
TEMPORARY TURNAROUND

(FOR INSIDE SUBDIVISION BOUNDARY TO BE MAINTAINED BY PROPERTY OWNER)

- TEMP. TURNAROUND NOTES:**
1. WHEN TURNAROUND CANNOT BE CONSTRUCTED OUTSIDE OF THE SUBDIVISION, IT SHALL BE LOCATED ON A PORTION OF THE SUBDIVISION LOTS (AS NEEDED) WITH THE SUBDIVIDER PLACING IN ESCROW AN AMOUNT OF MONEY SUFFICIENT TO COMPLETE THE STREET IMPROVEMENTS TO THE SUBDIVISION BOUNDARY. THESE FUNDS WILL BE USED AT SUCH TIME THE STREET IS EXTENDED.
 2. DRAINAGE ONTO ADJACENT PROPERTY MUST BE BY WRITTEN APPROVAL OF ADJACENT PROPERTY OWNER.
 3. IF THE TURNAROUND IS LOCATED ON ADJACENT PROPERTY THEN A TURNAROUND EASEMENT MUST BE OBTAINED FROM THE PROPERTY OWNER.
 4. THE LOT ON WHICH THE TURN AROUND IS CONSTRUCTED SHALL BE RESTRICTED AS FOLLOWS:
 1. PLATTED AS AN "R" "RESTRICTED" LOT.
 2. THIS LOT CANNOT BE SOLD OR BUILDING PERMITS ISSUED UNTIL THE ROAD IS EXTENDED BEYOND THE SUBDIVISION BOUNDARY COMPLETE WITH CURB & GUTTER AND SIDEWALK.



CONCRETE COLLAR DETAIL



SECTION A-A

REQUIRED GRADING BETWEEN TBC AND PROPERTY LINE

- CONCRETE COLLAR NOTES:**
1. ALL CONCRETE COLLARS TO BE INSTALLED WITHIN 14 DAYS AFTER PAVING.
 2. COLLARS AROUND MANHOLES AND CULINARY WATER VALVES ARE TO BE ROUND.
 3. COLLARS AROUND IRRIGATION VALVES ARE TO BE SQUARE.

PAVEMENT DIMENSION TABLE

DESCRIPTION	NEW ROAD	OVERLAY
A ASPHALT TO CONCRETE	1/2"	1/4"
B ASPHALT TO RING	3/4"	1/2"

NO.	DATE	DESCRIPTION

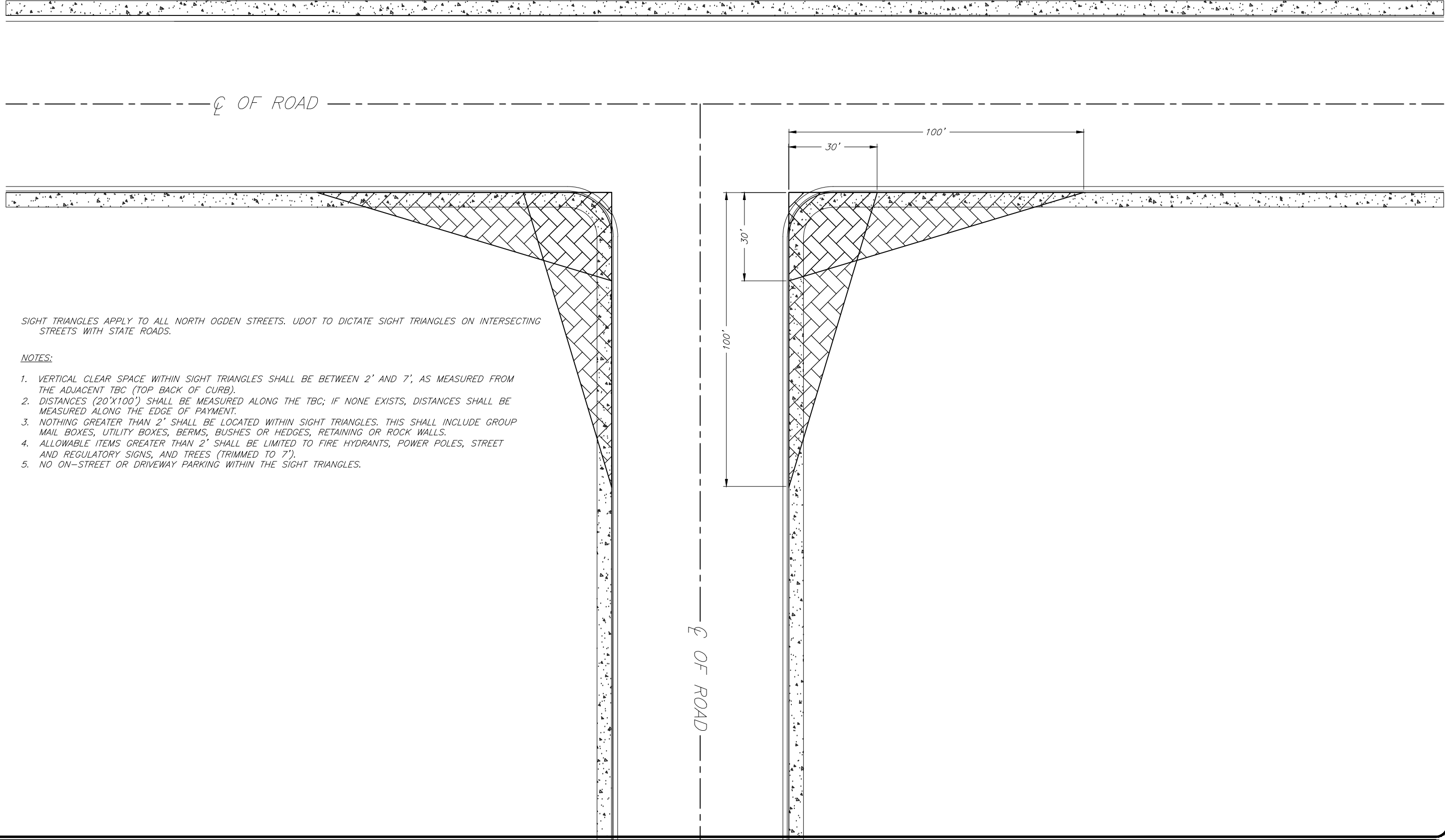
PROJECT: M. CHANDLER
 PROJECT MANAGER: A. THOMPSON
 CHECKED BY: A. THOMPSON
 DRAWN BY: O. CURTIS
 DRAWING SCALE: N.T.S.
 ISSUE DATE: 8/31/2022



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NORTH OGDEN CITY CORPORATION
 PUBLIC WORKS STANDARDS
 PUBLIC ROADS - CUL-DE-SAC & TEMP. TURNAROUND DETAILS

PROJECT NUMBER: 2020-0125
 SHEET: 09 OF 58
 SHEET NUMBER: RD-0



SIGHT TRIANGLES APPLY TO ALL NORTH OGDEN STREETS. UDOT TO DICTATE SIGHT TRIANGLES ON INTERSECTING STREETS WITH STATE ROADS.

NOTES:

1. VERTICAL CLEAR SPACE WITHIN SIGHT TRIANGLES SHALL BE BETWEEN 2' AND 7', AS MEASURED FROM THE ADJACENT TBC (TOP BACK OF CURB).
2. DISTANCES (20'X100') SHALL BE MEASURED ALONG THE TBC; IF NONE EXISTS, DISTANCES SHALL BE MEASURED ALONG THE EDGE OF PAYMENT.
3. NOTHING GREATER THAN 2' SHALL BE LOCATED WITHIN SIGHT TRIANGLES. THIS SHALL INCLUDE GROUP MAIL BOXES, UTILITY BOXES, BERMS, BUSHES OR HEDGES, RETAINING OR ROCK WALLS.
4. ALLOWABLE ITEMS GREATER THAN 2' SHALL BE LIMITED TO FIRE HYDRANTS, POWER POLES, STREET AND REGULATORY SIGNS, AND TREES (TRIMMED TO 7').
5. NO ON-STREET OR DRIVEWAY PARKING WITHIN THE SIGHT TRIANGLES.

RECORD OF REVISIONS			
NO.	DATE	DESCRIPTION	BY

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

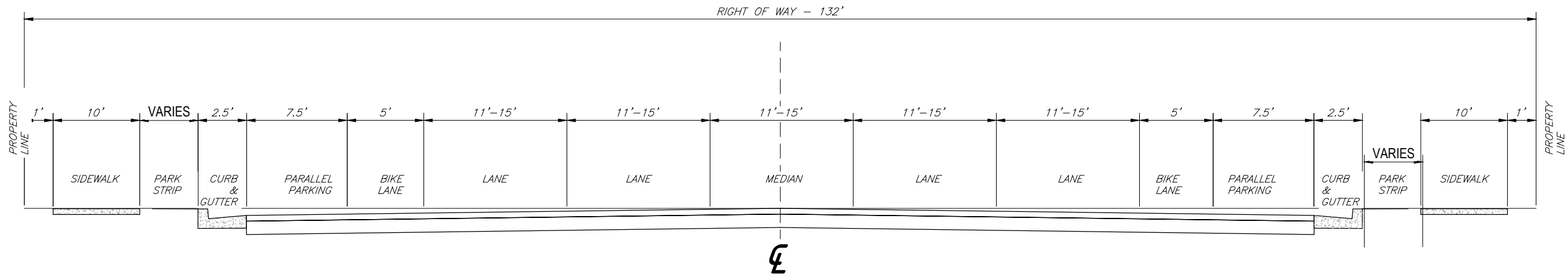
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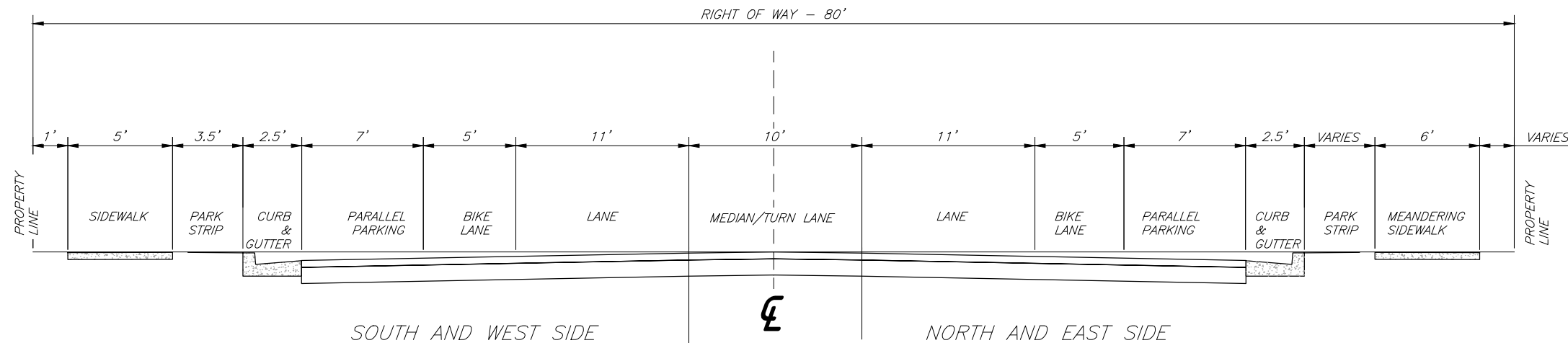
NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
PUBLIC ROADS - TYPICAL SIGHT TRIANGLES

PROJECT NUMBER 2020-0125	
SHEET 10	OF 58
SHEET NUMBER RD-0	



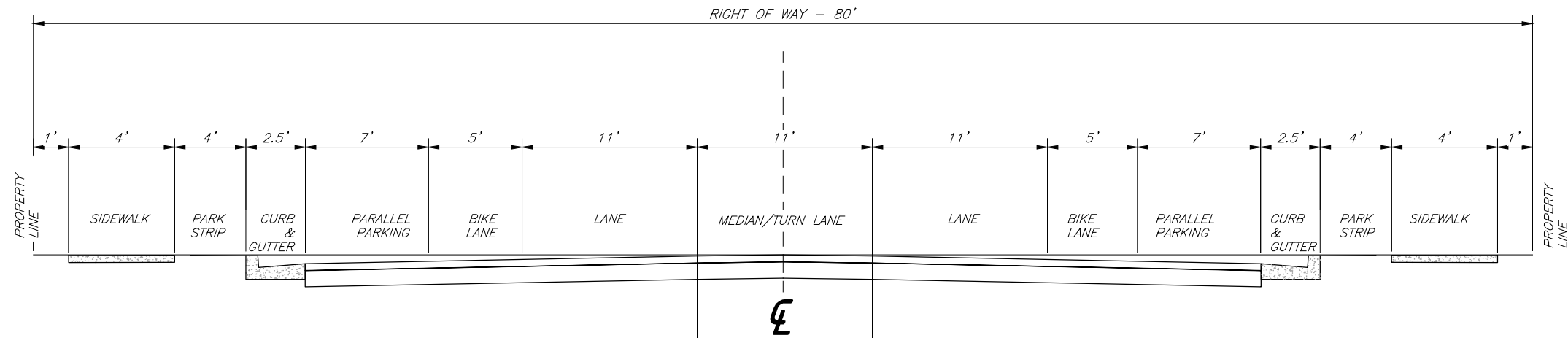
WASHINGTON BLVD. FROM 2650 NORTH TO SOUTH CITY LIMITS & 2700 NORTH FROM THE WEST CITY LIMIT TO 475 EAST

SECTION VIEW



MOUNTAIN ROAD

SECTION VIEW



MONROE BLVD

SECTION VIEW

File Path: P:\2020-0125 North Ogden-City Engineer\Drawings\Sheet\SRD-08.dwg Aug 31, 2022 - 4:40pm

NO.	DESCRIPTION	DATE
7.		

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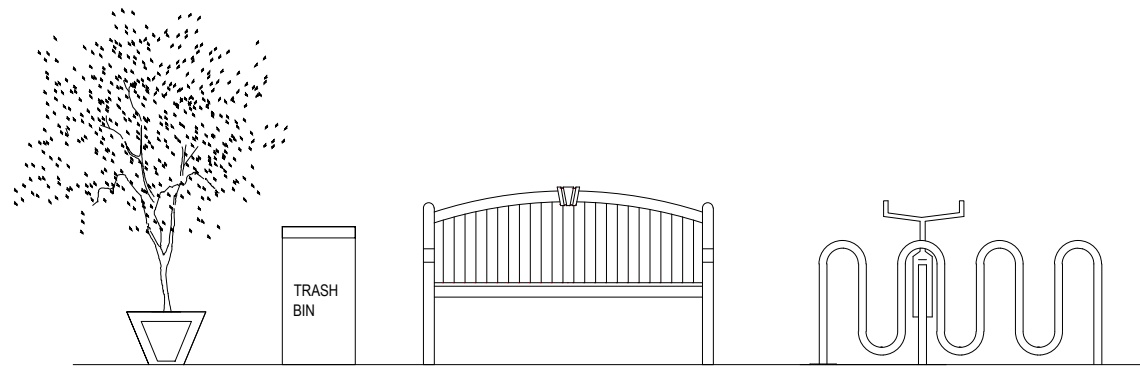
PRINCIPAL: M. CHANDLER
 PROJECT MANAGER: A. THOMPSON
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NORTH OGDEN CITY CORPORATION
 PUBLIC WORKS STANDARDS
 STREETSCAPE STANDARDS

PROJECT NUMBER 2020-0125	
SHEET 11	OF 58
SHEET NUMBER RD-C	

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PARK STRIP AMENITY DETAIL (SEE SHEET NOTES)
WASHINGTON BLVD. FROM 2650 NORTH TO SOUTH CITY LIMITS &
2700 NORTH FROM THE WEST CITY LIMIT TO 475 EAST

SHEET NOTES:

STREET TREES:

1. MINIMUM 2 INCH CALIPER TREES EVENLY SPACED BETWEEN EXISTING STREET LIGHTS. IF THERE ARE NO STREET LIGHTS, THE TREES AND SPACING SHALL BE APPROVED BY THE PLANNING COMMISSION.
2. ADDITIONAL TREES MAY BE ADDED IF DESIRED BY PROPERTY OWNER.
3. ALLOWED TREES FOR WASHINGTON BLVD (SUITABLE UNDER POWER LINES):
 - FLOWERING CRABAPPLE (NON-FRUITING, NON-WEeping VARIETIES)
 - CANADA CHOKECHERRY (WHITE FLOWERS, GREEN LEAVES TURN PURPLE)

FURNISHINGS:

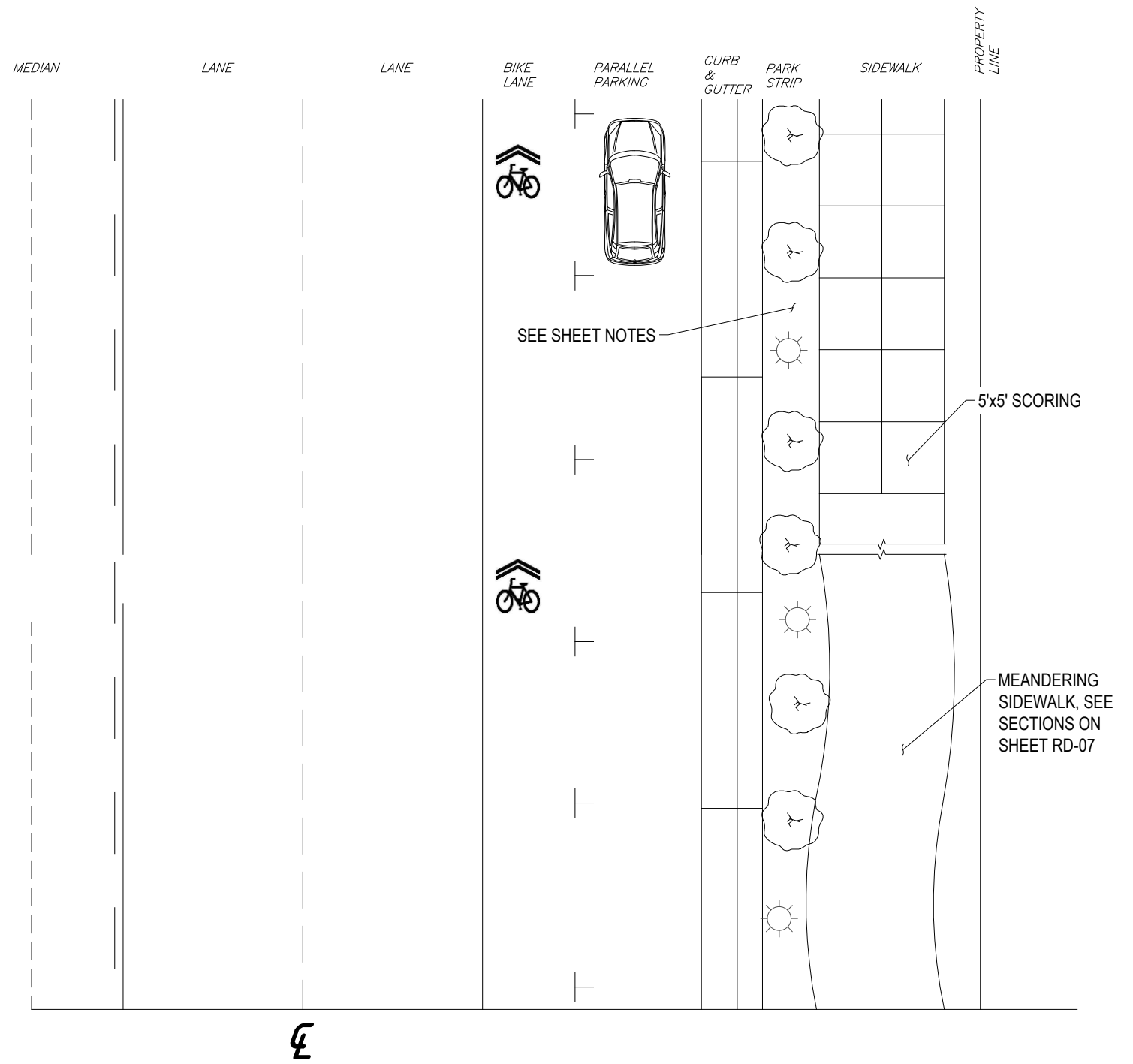
1. SEATING, PLANTERS, TRASH RECEPTACLES, BIKE RACKS TO BE LOCATED AT BUS STOPS SHOWN ABOVE.
2. DECORATIVE STREET LIGHTS SHALL BE PLACED AT A MAXIMUM 100 FT SPACING

PARK STRIP:

1. PARKING STRIP GROUND COVER AS APPROVED BY THE PLANNING COMMISSION; IT MAY INCLUDE A XERISCAPE DESIGN
2. PARK STRIP WIDTHS ARE DETERMINED BY CONSIDERING THE AVAILABLE AREA BETWEEN THE BACK OF CURB TO THE PROPERTY LINE AFTER DEDUCTING THE SIDEWALK WIDTH.

SIDEWALK:

1. STANDARD SIDEWALK WIDTH IS 10', WITH 5'X5' SCORING PATTERN.
2. SIDEWALK WIDTH LESS THAN 10' MAY BE APPLICABLE ON A CASE BY CASE BASIS, BUT IN NO CASE LESS THAN 8' IN WIDTH.
3. SIDEWALK WIDTHS DIFFER ON MOUNTAIN RD. AND MONROE BLVD, SEE TYPICAL SECTIONS ON SHEET RD-07.



PLAN VIEW

WASHINGTON BLVD., MOUNTAIN ROAD, AND MONROE BLVD STREETSCAPE

NO.	DESCRIPTION	DATE
7.		

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PRINCIPAL: M. CHANDLER
 PROJECT MANAGER: A. THOMPSON
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 DRAWING SCALE: N.T.S.
 ISSUE DATE: 8/31/2022

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NORTH OGDEN CITY CORPORATION
 PUBLIC WORKS STANDARDS
 STREETSCAPE STANDARDS

PROJECT NUMBER 2020-0125	
SHEET 12	OF 58
SHEET NUMBER RD-08	

CULINARY WATER STANDARD DRAWINGS - APPROVED MATERIALS

1" METER		
PART	APPROVED MATERIAL	STANDARD DRAWING
METER BOX LID	D&L SUPPLY, L-2240-10	CW-01
PIT RING	D&L SUPPLY, L-2244	CW-01
METER YOKE	MUELLER, B-2470-6A; FORD COMPRESSION FITTING	CW-01
LOCK WING	MUELLER, 300; FORD	CW-01
SADDLE TAP	MUELLER, B2008	CW-01
TAP ON PVC PIPE	ROMAC 202NS	CW-01
COMPRESSION CONNECTION	MUELLER B 25028	CW-01

1 1/2" & 2" METER		
PART	APPROVED MATERIAL	STANDARD DRAWING
TAP SADDLE	ROMAC 202BS	CW-01
CORP STOP	MUELLER B-25028	CW-01
METER YOKE	MUELLER, B-2423	CW-01
COMPRESSION CONN. COUPLING	MUELLER 110	CW-01

HYDRANTS		
PART	APPROVED MATERIAL	STANDARD DRAWING
FLUSH HYDRANT IN PERMANENT CUL-DE-SAC	ECLIPSE, MODEL #2	CW-02
FIRE HYDRANTS	WATEROUS CLASSIC, CLOW MEDALLION, MUELLER CENTURION, OR EICO	CW-02

GATE VALVES		
PART	APPROVED MATERIAL	STANDARD DRAWING
VALVE	MUELLER, A-2361	CW-02
VALVE BOX AND LID	TYLER, 564-S	CW-02
TRACER WIRE BOX	COPPERHEAD INDUSTRIES SNAKEPIT, CD14*TP	CW-03

PIPE		
PART	APPROVED MATERIAL	STANDARD DRAWING
TRANSITION COUPLING	ROMAC, MODEL 501	CW-02

PART	APPROVED MATERIAL	STANDARD DRAWING
GATE VALVE WITH HANDWHEEL	MUELLER 2300	CW-04
FLANGED COUPLING ADAPTER	ROMAC, FCA501	CW-04
DISMANTLING JOINT	ROMAC, DJ400	CW-04
FLEXIBLE PIPE COUPLING	ROMAC, 501	CW-04
GAVALNIZED PIPE SUPPORT	CLOW, F-1608, OR ANVIL #264	CW-04
SUMP GRATE	D&L, 6016	CW-04
MANHOLE RING AND COVER	D&L, A-1180	CW-04
RETAINER GLAND	ROMAC	CW-04
AIR VAC RELIEF VALVE	APCO MODEL 145C	CW-04
FITTINGS OUTSIDE VAULT	ROMAC, MJRG	CW-04

PART	APPROVED MATERIAL	STANDARD DRAWING
MANHOLE RING AND COVER	D&L, A-1180	CW-06
SUMP GRATE	D&L, 6016	CW-06
PRESSURE RELIEF VALVE	CLA-VAL 50-01	CW-06
GATE VALVE WITH HANDWHEEL	MUELLER, 2300	CW-06
DISMANTLING JOINT	ROMAC, DJ400	CW-06
GAVALNIZED PIPE SUPPORT	CLOW, F-1608, OR ANVIL #264	CW-06
FITTINGS OUTSIDE VAULT	ROMAC, MJRG	CW-06

ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY WATER DEPARTMENT SUPERINTENDENT.

NO.	DESCRIPTION	DATE

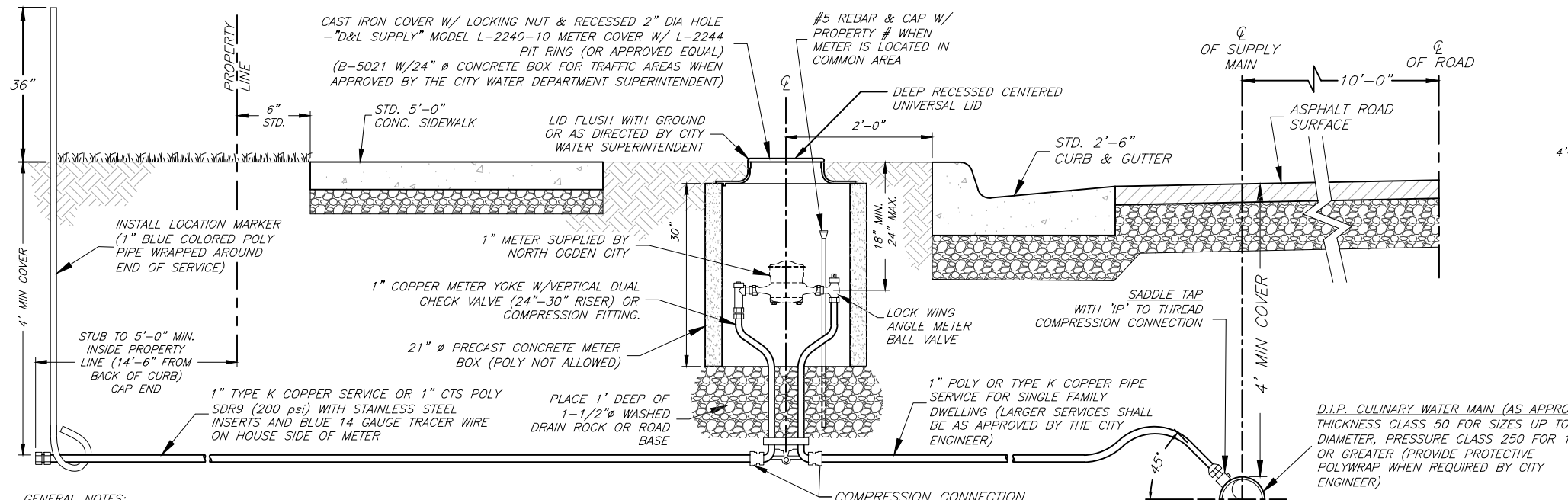
PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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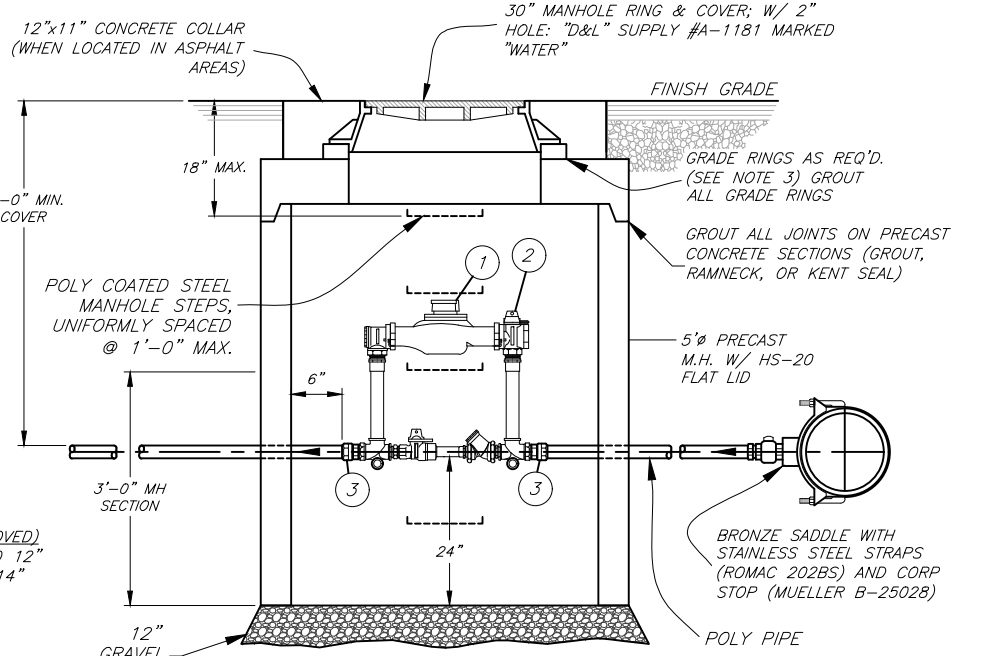
NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
CULINARY WATER - APPROVED MATERIALS

PROJECT NUMBER 2020-0125
SHEET 13 OF 58
SHEET NUMBER CW- 7



- GENERAL NOTES:**
1. PROPERTY OWNER OR CONTRACTOR SHALL PAY FOR ALL COSTS OF INSTALLATION INCLUDING ALL MATERIALS, ALL EXCAVATION AND FILL, ASPHALT REPLACEMENT AND WATER MAIN CONNECTION. CITY TO FURNISH METER (UP TO 1" SIZE) AT NO COST.
 2. INSPECTION OF ALL WATER LINE INSTALLATIONS WILL BE DONE BY NORTH OGDEN CITY WATER DEPARTMENT, WITH A 48 HOUR MINIMUM NOTICE REQUIRED PRIOR TO START OF WORK.
 3. IF APPLICABLE, A NORTH OGDEN CITY CUT PERMIT MUST BE REQUESTED AND APPROVED PRIOR TO START OF WORK.
 4. PROPERTY OWNER RESPONSIBLE FOR PIPING AND FITTINGS ON HOUSE SIDE OF THE METER.

TYPICAL CULINARY WATER SERVICE CONNECTION

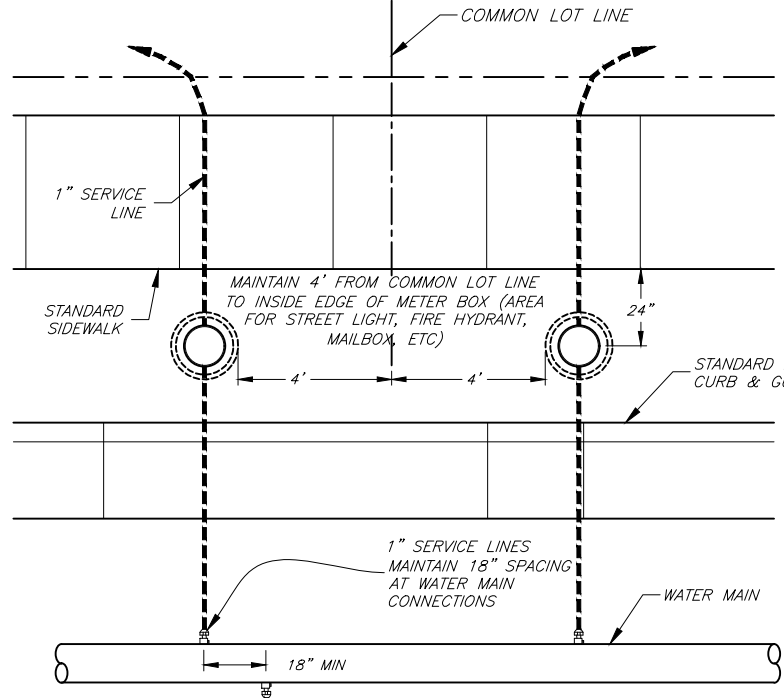


1 1/2" & 2" WATER METER STATION

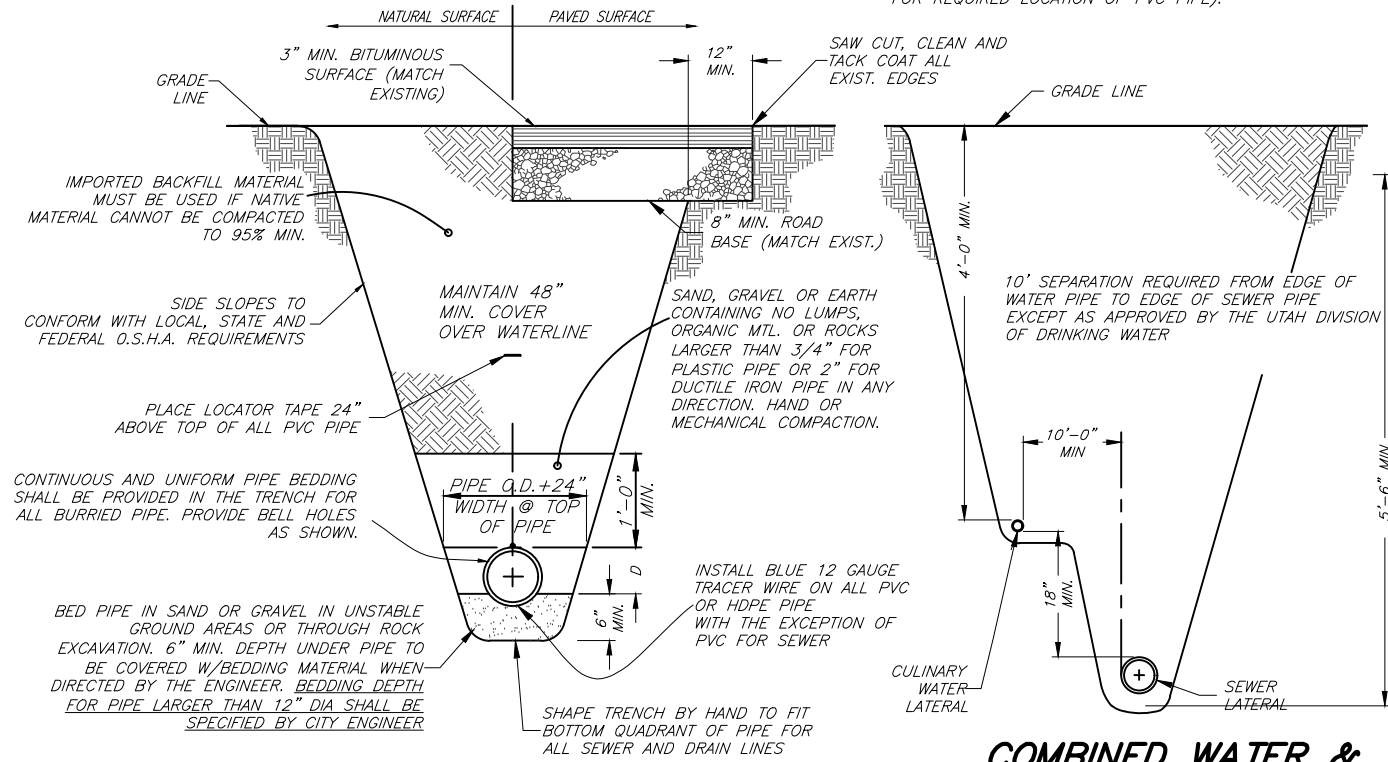
NO.	DESCRIPTION	JOINT TYPE	1 1/2" LINE	2" LINE
1	"OCTAVE ULTRASONIC" METER (SUPPLIED BY CITY)	FL	1 1/2"	2"
2	METER YOKE (18" HEIGHT)	-	1 1/2"	2"
3	COMPRESSION CONN. COUPLING	-	1 1/2"	2"

- 1 1/2" & 2" METER NOTES:**
1. 1 1/2" SERVICE LINE-13" METER
2" SERVICE LINE-17" METER
 2. CITY SHALL SUPPLY METER.
 3. NO MORE THAN 12" OF GRADE RINGS TO BE ALLOWED ON ANY MANHOLE
 4. RAISE ALL MANHOLES TO FINISH GRADE OF STREET FOLLOWING PAVING WITH A CONCRETE COLLAR. COLLAR TO BE HELD DOWN 1/2" BELOW TOP OF NEW ASPHALT.
 5. ALL SERVICE LINES TO METER SHALL BE POLY OR TYPE K COPPER PIPE.

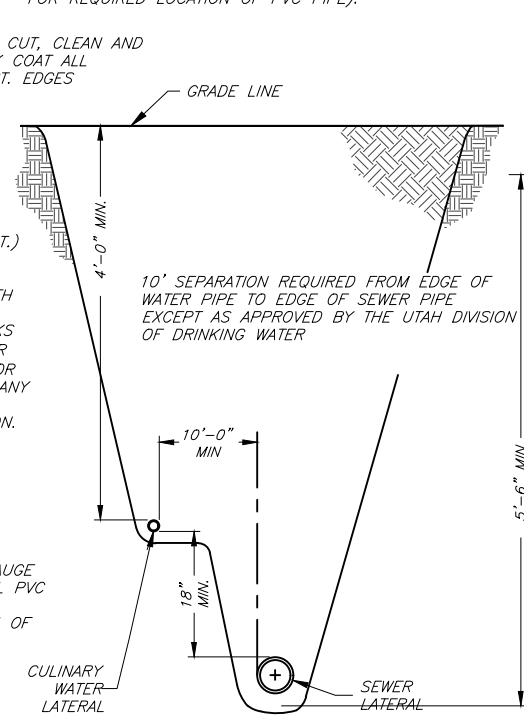
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STANDARD WATER METER LOCATION



TYPICAL TRENCH SECTION
(WATER, SEWER, AND STORM DRAIN)



COMBINED WATER & SEWER SECTION

RECORD OF REVISIONS			

PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
CULINARY WATER - RESIDENTIAL WATER SERVICE, 1 1/2" & 2" METER STATION, & PIPE TRENCH DETAILS

PROJECT NUMBER 2020-0125
SHEET NUMBER 14 OF 58
SHEET NAME CW-

THRUST PER PSI OF WATER PRESSURE AT VARIOUS FITTINGS				
PIPE SIZE (IN.)	DEAD END OR TEE (LB.)	90° ELBOW (LB.)	45° ELBOW (LB.)	22-1/2° ELBOW (LB.)
4	19	27	15	7
6	39	55	30	15
8	67	94	51	26
10	109	154	84	43
12	155	218	119	61
14	210	296	161	82
16	272	383	209	106
18	351	494	269	137
20	434	611	333	169
24	623	878	487	244
30	947	1,332	722	377
36	1,356	1,905	1,032	542

THRUST BLOCK TABLE NOTES:

- IN USING THE ABOVE TABLE, USE THE MAXIMUM INTERNAL PRESSURE ANTICIPATED (I.E. HYDROSTATIC TEST PRESSURE, POSSIBLE SURGE PRESSURE DUE TO PUMP SHUT OFF, ETC.).
- SEE SOILS REPORT FOR BEARING STRENGTH OF SOIL. IN THE ABSENCE OF A SOILS REPORT, AN AVERAGE SOIL (SPADABLE MEDIUM CLAY) CAN BE ASSUMED TO HAVE A BEARING STRENGTH OF 2000 P.S.F.

EXAMPLE:

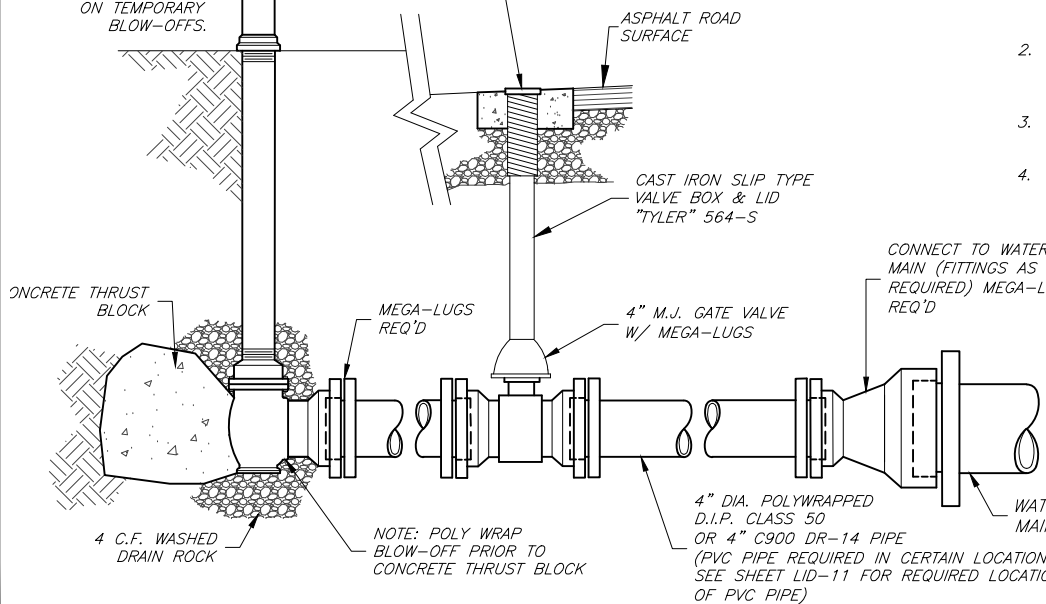
8-INCH 90° ELBOW, PRESSURE 200 LB./SQ. IN.
FROM TABLE: THRUST = 94 X 200 = 18,800 LB.
ASSUME BEARING STRENGTH = 2,000 LB./SQ. FT.

18,800 / 2,000 = 9.4 SQ. FT. AREA OF BEARING REQUIRED FOR THRUST BLOCK

4" M.J. "ECLIPSE" MODEL #2 BLOW-OFF POST HYDRANT IN PERMANENT CUL-DE-SACS

2" BLOW-OFF HYDRANT W/ 2" SADDLE ON MAIN NEAR END OF LINE ON TEMPORARY BLOW-OFFS.

ADJUST ALL WATER VALVE BOXES TO GRADE FOLLOWING PAVING WITH CONCRETE COLLAR. COLLAR TO BE HELD DOWN 1/2" BELOW TOP OF NEW ASPHALT

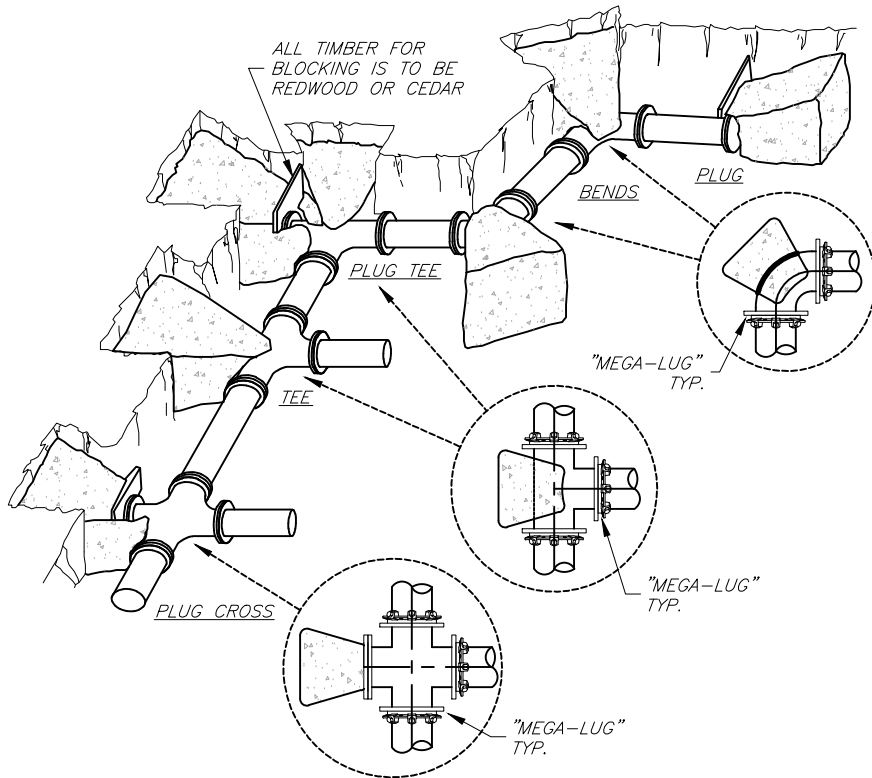


TYPICAL FLUSH VALVE CONNECTION

FLUSH VALVES AND CONNECTION MAY BE 2" FOR TEMPORARY INSTALLATIONS.

NOTE: POLY WRAP BLOW-OFF PRIOR TO CONCRETE THRUST BLOCK
4" DIA. POLYWRAPPED D.I.P. CLASS 50 OR 4" C900 DR-14 PIPE (PVC PIPE REQUIRED IN CERTAIN LOCATIONS. SEE SHEET LID-11 FOR REQUIRED LOCATION OF PVC PIPE)
WATER MAIN

TYPICAL RETAINER GLANDS & THRUST BLOCKING

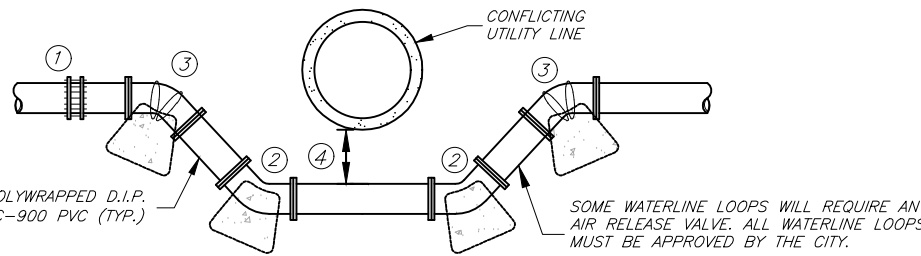


PIPE RESTRAINT

- ALL BENDS, CROSSES, TEES, REDUCERS, AND VALVES SHALL BE INSTALLED WITH RESTRAINING JOINTS ("MEGA-LUG" OR APPROVED EQUAL).
- DESIGN SHALL ALSO BE REQUIRED TO ENSURE ADEQUATE RESTRAINT FOR PIPING JOINTS NEAR FITTINGS BASED ON PIPE DIAMETER AND PIPE PRESSURE.
- BELL RESTRAINTS MAY BE USED AND/OR REQUIRED BY NORTH OGDEN CITY.

THRUST BLOCKING NOTES:

- CONCRETE SHALL NOT BE PLACED WITHIN 1-1/2" OF JOINTS AND BOLTS. COVER ALL METAL CONTACT AREAS WITH A POLY WRAP PRIOR TO CONCRETE PLACEMENT.
- IN THE ABSENCE OF A SOILS REPORT, ALL THRUST BLOCKS SHALL BE SIZED ON THE BASIS OF A MAXIMUM LATERAL BEARING VALUE FOR 2000 P.S.F. AND A THRUST RESULTING FROM 200% OF THE WATER LINE STATIC LINE TEST.
- THRUST BLOCKS ARE REQUIRED AT ALL BENDS OF 22-1/2" OR MORE.
- CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF NOT LESS THAN 2500 PSI IN 28 DAYS.



TYPICAL WATERLINE LOOP

FIRE LINE NOTES:

- NO WATER SERVICE OR FIRE LINES TO BUILDINGS ARE PERMITTED TO CONNECT TO AUXILIARY LINES SERVICING FIRE HYDRANTS.
- COMMERCIAL FIRE LINES FROM THE MAIN TO BUILDING SHALL BE SEPARATE LINES AND NOT PART OF THE WATER SERVICE LATERAL.
- FIRE LINES ARE TO BE MAINTAINED BY THE PROPERTY OWNER UP TO THE VALVE AT THE MAIN. THE CITY SHALL OWN AND MAINTAIN THE FIRE SUPPRESSION LINE VALVE AT THE MAIN.
- FIRE HYDRANTS AND FIRE LINES ON PRIVATE PROPERTY SHALL BE OWNED AND MAINTAINED BY THE PROPERTY OWNER UNLESS OTHERWISE SPECIFIED.
- FIRE HYDRANTS ARE TO BE INSTALLED IN LOCATIONS AS REQUIRED BY THE FIRE CODE AND APPROVED BY THE FIRE CHIEF AND CITY ENGINEER.
- FIRE HYDRANTS SHALL NOT BE CONNECTED TO, OR LOCATED WITHIN, 10 FEET OF SANITARY SEWERS. WHERE POSSIBLE, HYDRANT DRAINS SHALL NOT BE LOCATED WITHIN 10 FEET OF STORM DRAINS.

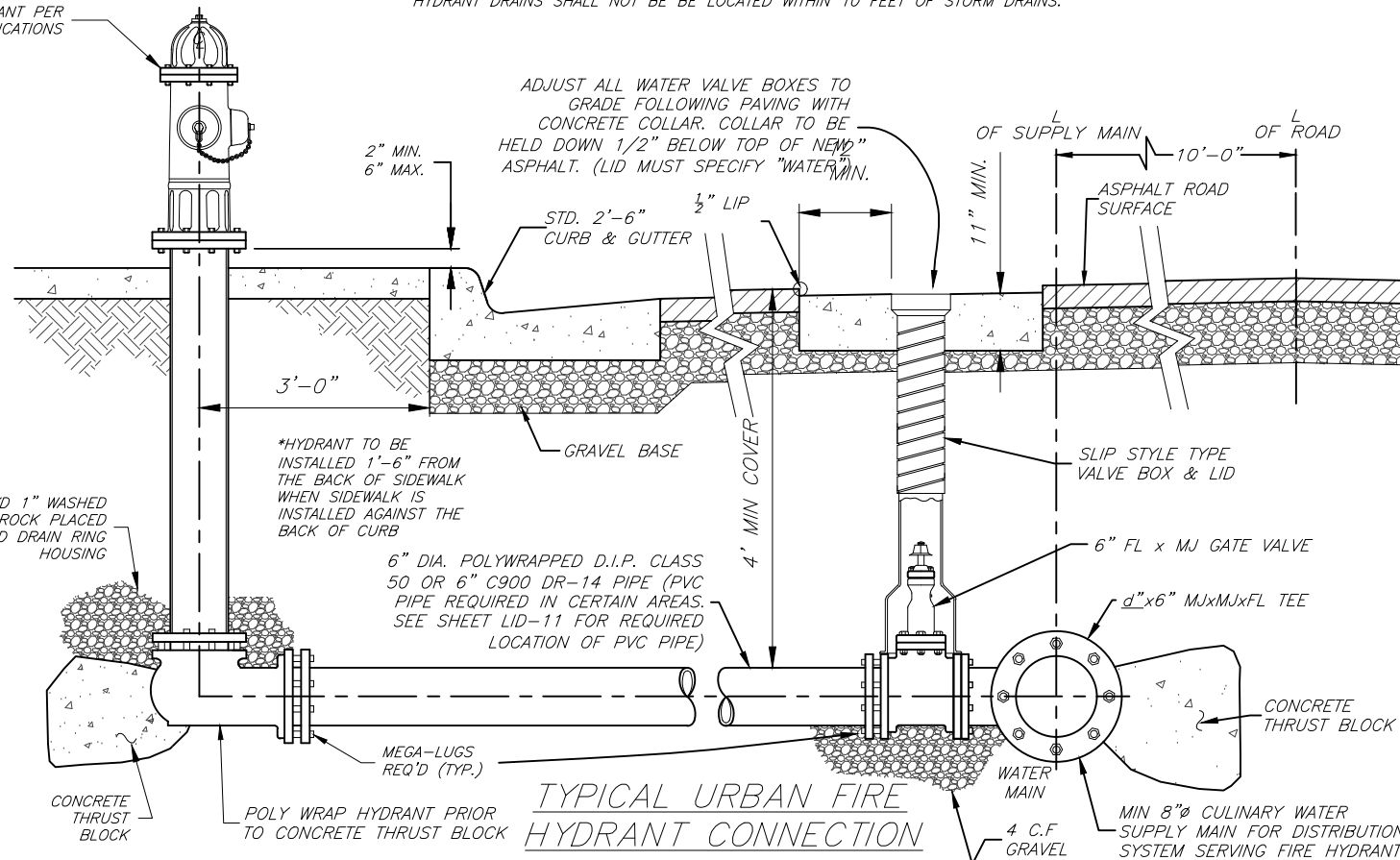
BLOW-OFF NOTES:

- PERMANENT BLOW-OFFS SHALL BE 4" AS SHOWN BELOW. TEMPORARY BLOW-OFFS MAY BE 2" WITH 2" POLY AND 2" GATE VALVE WITH VALVE BOX AT MAIN.
- WHEN TEMPORARY BLOW-OFFS ARE REMOVED THE MAIN SHALL ALSO BE REMOVED WHERE THE BLOW-OFF IS CONNECTED.
- NO TAPS ARE ALLOWED ON THE MAIN. USE A CAP W/ THREADED CORP STOP CONNECTION.
- NO FLUSHING DEVICE SHALL BE DIRECTLY CONNECTED TO A SEWER LINE.

GENERAL NOTES:

- THE USE OF "BLUE" BOLTS AND NUTS IS APPROVED BY THE CITY.
- ALL WATER MAIN AND HYDRANT GATE VALVES TO BE 350 PSI RESILIENT WEDGE VALVES.
- ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY WATER DEPARTMENT SUPERINTENDENT.
- IRON PIPE NIPPLES TO BE STAINLESS STEEL ON ALL FITTINGS SMALLER THAN 4"; NO BRASS, GALVANIZED, OR BLACK STEEL.
- ONLY BRASS, BRONZE ON METER SETTERS, CORPORATION STOPS.

FIRE HYDRANT PER NORTH OGDEN SPECIFICATIONS



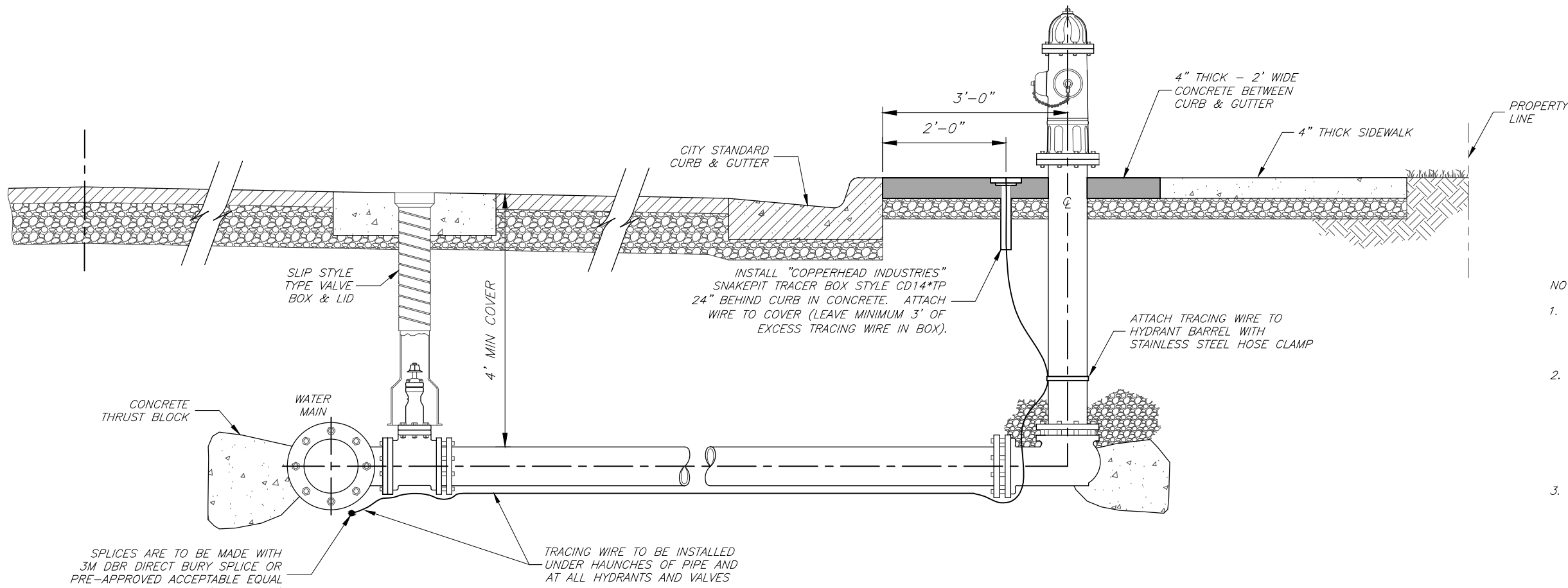
TYPICAL URBAN FIRE HYDRANT CONNECTION

REVISION	DATE	BY	CHKD

<p>PROJECT MANAGER A. THOMPSON</p> <p>CHECKED BY A. THOMPSON</p> <p>DRAWN BY O. CURTIS</p> <p>DRAWING SCALE N.T.S.</p> <p>ISSUE DATE 8/31/2022</p>	<p>PRINCIPAL M. CHANDLER</p>
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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
 CULINARY WATER - THRUST BLOCK, WATERLINE LOOP, FLUSH VALVE, & FIRE HYDRANT DETAILS

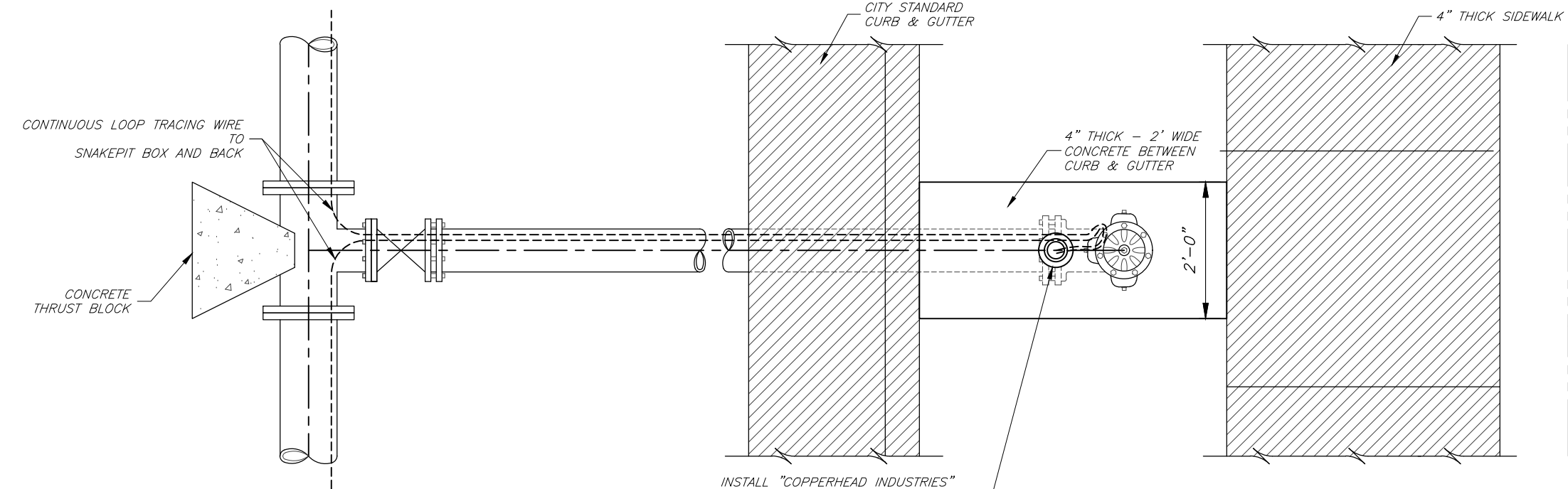
PROJECT NUMBER	2020-0125
SHEET	15 OF 58
SHEET NUMBER	CW-



- NOTES:
1. ALL WATERLINES SHALL HAVE A MINIMUM 12 GA. INSULATED TRACING WIRE INSTALLED UNDER THE HAUNCHES OF THE PIPE PRIOR TO BACKFILLING.
 2. TRACING WIRES SHALL TERMINATE AT ALL FIRE HYDRANTS. AT SERVICE SADDLES AND TAPPING SLEEVES, THE TRACING WIRE SHALL NOT BE ALLOWED TO BE PLACED BETWEEN THE SADDLE AND THE PIPE. A GROUNDING ROD SHALL BE INSTALLED AT ALL TRACER SYSTEM TERMINAL POINTS.
 3. TRACING WIRE SHALL BE COPPER WIRE WITH BLUE INSULATION RATED FOR DIRECT BURIAL. ALL WIRE CONNECTORS SHALL BE 3M DBR DIRECT BURY SPLICE OR PRE-APPROVED ACCEPTABLE EQUAL AND SHALL BE WATERTIGHT TO PROVIDE ELECTRICAL CONTINUITY.
 4. ALL TRACING WIRE SHALL BE TESTED FOR CONTINUITY IN THE PRESENCE OF THE PUBLIC WORKS INSPECTOR PRIOR TO ASPHALT PLACEMENT. ANY TRACING WIRE FOUND NOT TO BE CONTINUOUS AFTER TESTING SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR PRIOR TO ASPHALT PLACEMENT.
 5. BEST EFFORTS SHALL BE MADE TO NOT SPLICE WIRE BUT TO USE A CONTINUOUS PIECE.

SPLICES ARE TO BE MADE WITH 3M DBR DIRECT BURY SPLICE OR PRE-APPROVED ACCEPTABLE EQUAL (AS NEEDED)

TRACING WIRE TO BE INSTALLED UNDER HAUNCHES OF PIPE AND AT ALL HYDRANTS AND VALVES



INSTALL "COPPERHEAD INDUSTRIES" SNAKEPIT TRACER BOX STYLE CD14*TP 24" BEHIND CURB IN CONCRETE. ATTACH WIRE TO COVER (LEAVE MINIMUM 3' OF EXCESS TRACING WIRE IN BOX).

TRACER WIRE INSTALLATION

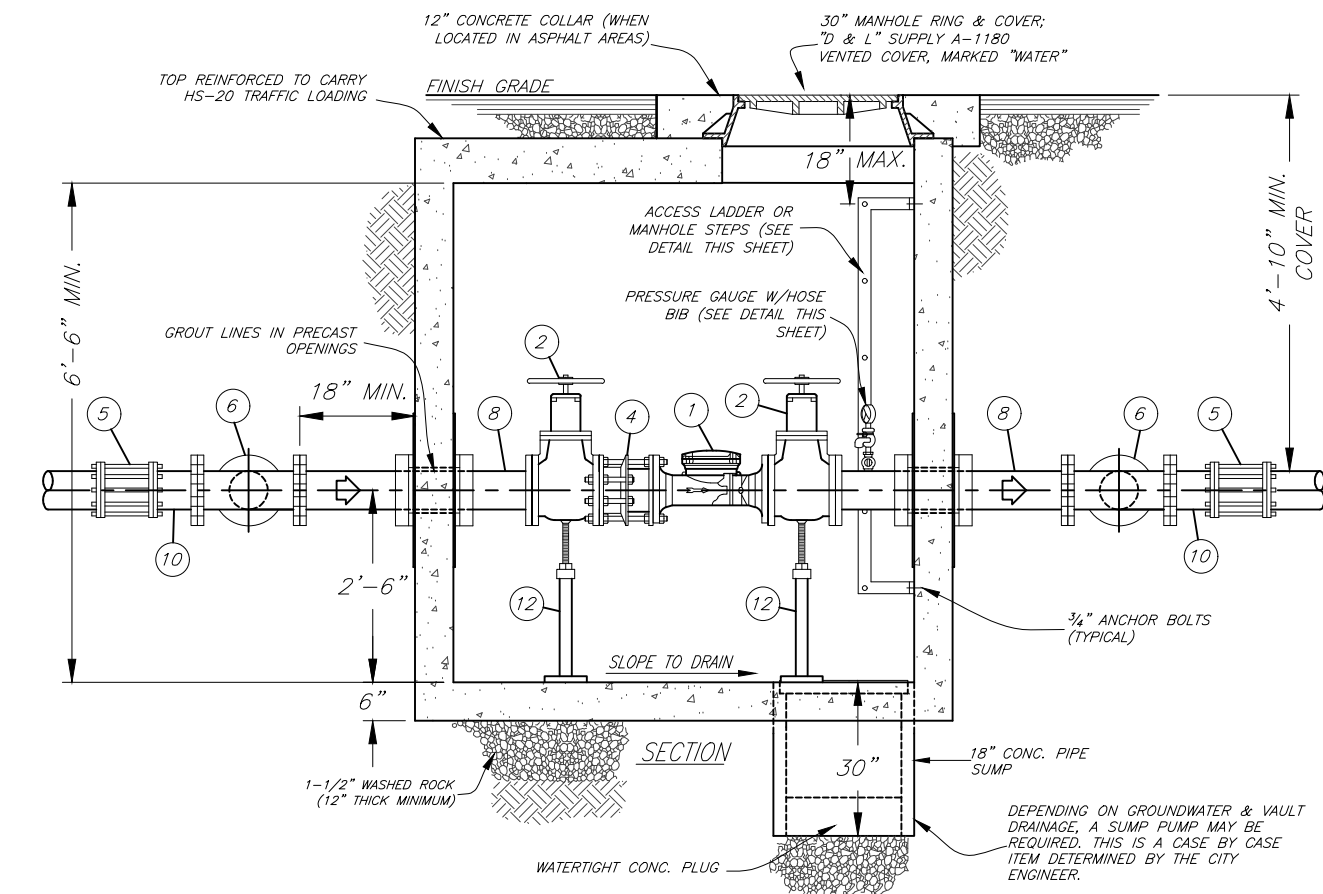
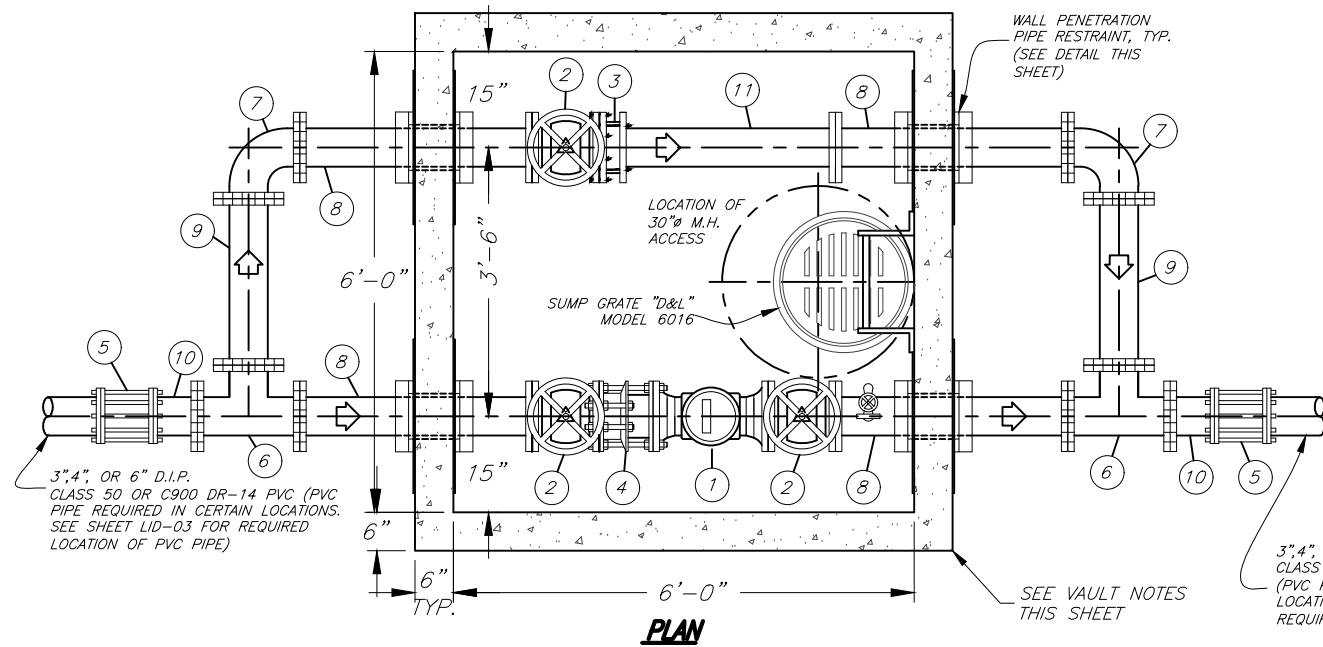
NO.	DESCRIPTION	DATE

PRINCIPAL
M. CHANDLER
PROJECT MANAGER
A. THOMPSON
CHECKED BY
A. THOMPSON
DRAWN BY
O. CURTIS
DRAWING SCALE
N.T.S.
ISSUE DATE
8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
CULINARY WATER - TRACING WIRE INSTALLATION DETAILS

PROJECT NUMBER 2020-0125
SHEET 16 OF 58
SHEET NUMBER CW- Page 31



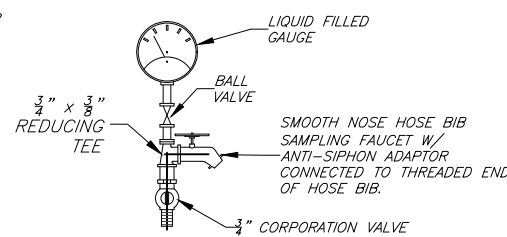
3, 4 & 6" WATER METER STATION

- VAULT NOTES:
1. ALL FITTINGS OUTSIDE OF THE VAULT ARE TO BE DUCTILE IRON MJ WITH THRUST RESTRAINT RETAINER GLANDS
2. PENETRATION WALLS NEED TO BE ADEQUATELY DESIGNED STRUCTURALLY FOR ANTICIPATED THRUST
3. THE PRECAST VAULT MANUFACTURER IS RESPONSIBLE FOR DESIGN RELATED TO TRAFFIC LOADING AND THRUST. VERIFICATION OF PROPER DESIGN MUST BE PROVIDED TO THE CITY BY THE DEVELOPER, CONTRACTOR, OR PROPERTY OWNER AS THE CASE MAY BE.
4. ALL FITTINGS SHALL BE ANKA C-110 WITH 125 LB. FLANGES. ALL PIPING SHALL BE DUCTILE IRON PIPE CLASS 350 P.S.I. MIN.
5. USE FOOD GRADE ANTI-SEIZE ON ALL THREADED FITTINGS.

PIPE & FITTING SCHEDULE

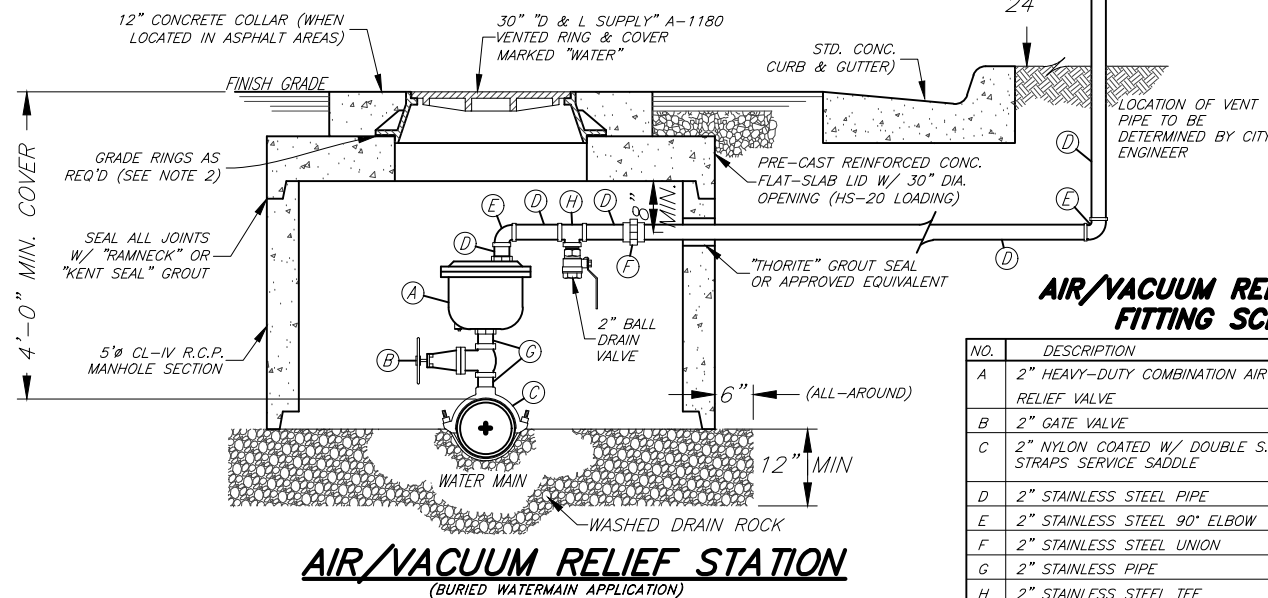
Table with 6 columns: NO., DESCRIPTION (3", 4" & 6" METER STA.), JOINT TYPE, 3" LINE, 4" LINE, 6" LINE. It lists items 1-12 including meters, valves, couplings, joints, and nipples.

GENERAL ASSEMBLY NOTE:
THE USE OF "BLUE" BOLTS AND NUTS IS APPROVED BY THE CITY



PRESSURE GAUGE W/SAMPLING FAUCET DETAIL

- AIR/VACUUM RELIEF STATION NOTES:
1. NO MORE THAN 12" OF GRADE RINGS TO BE ALLOWED ON ANY MANHOLE.
2. RAISE ALL MANHOLES TO FINISH GRADE OF STREET FOLLOWING PAVING WITH A CONCRETE COLLAR, COLLAR TO BE HELD DOWN 3/4" BELOW TOP OF NEW ASPHALT.

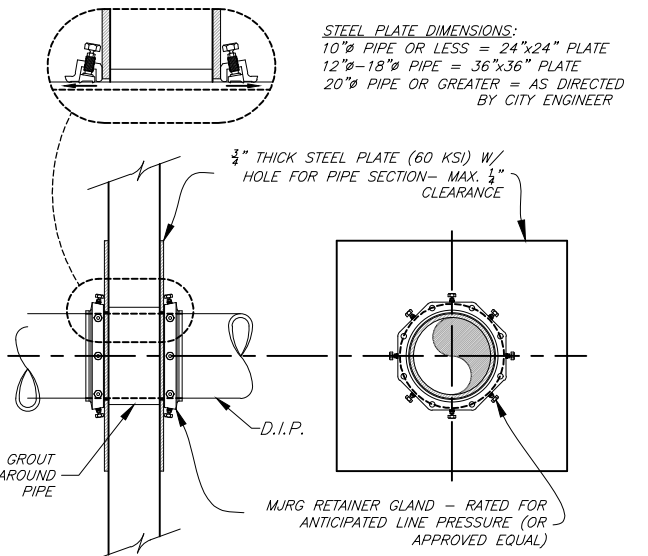


AIR/VACUUM RELIEF STATION (BURIED WATERMAIN APPLICATION)

AIR/VACUUM RELIEF STATION FITTING SCHEDULE

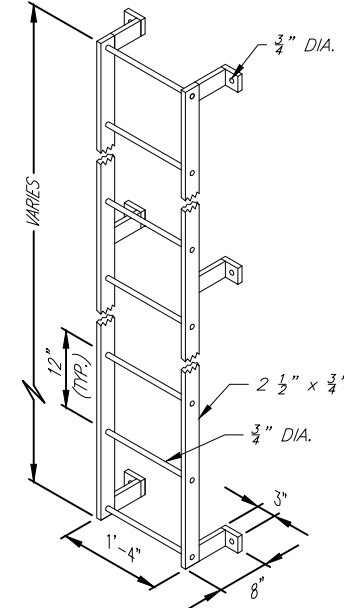
Table with 3 columns: NO., DESCRIPTION, FITTING. It lists items A-H including relief valves, gate valves, saddles, elbows, unions, and tees.

THE ANCHOR PINS OF THE RESTRAINING GLAND MUST POINT AWAY FROM THE VAULT WALL AS SHOWN.



WALL PENETRATION DETAIL FOR PRECAST VAULT (TYP)

ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY WATER DEPARTMENT SUPERINTENDENT.



LADDER DETAIL HOT DIP GALVANIZE AFTER FABRICATION

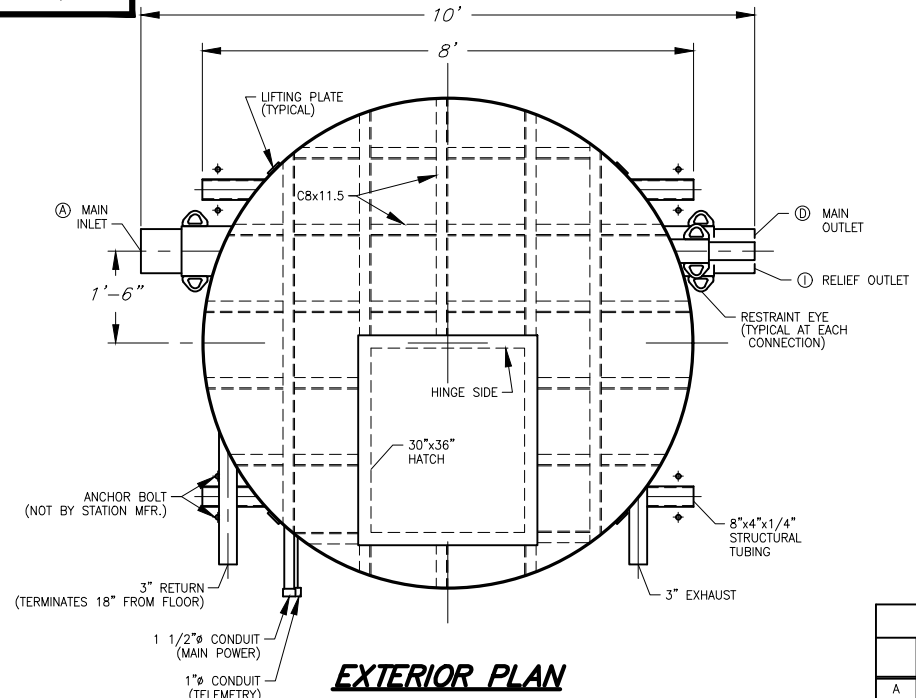
Table with columns for REVISIONS, PRINCIPAL, PROJECT MANAGER, CHECKED BY, DRAWN BY, and DRAWING SCALE.

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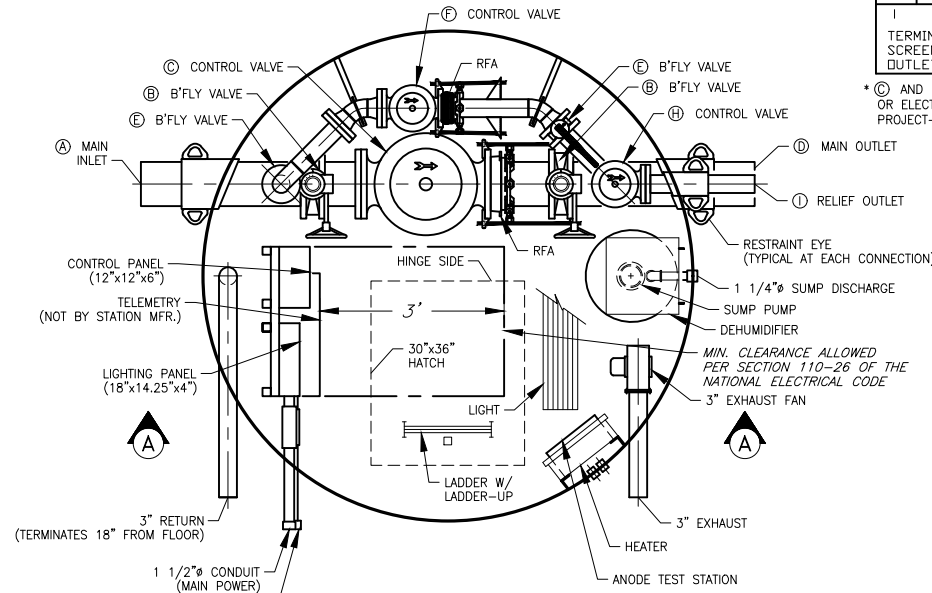
NORTH OGDEN CITY CORPORATION PUBLIC WORKS STANDARDS CULINARY WATER - 3", 4", 6" WATER METER STATIONS & AIR/VACUUM RELIEF STATION DETAILS

PROJECT NUMBER: 2020-0125 SHEET: 17 OF 58 SHEET NUMBER: CW- Page 32

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EXTERIOR PLAN



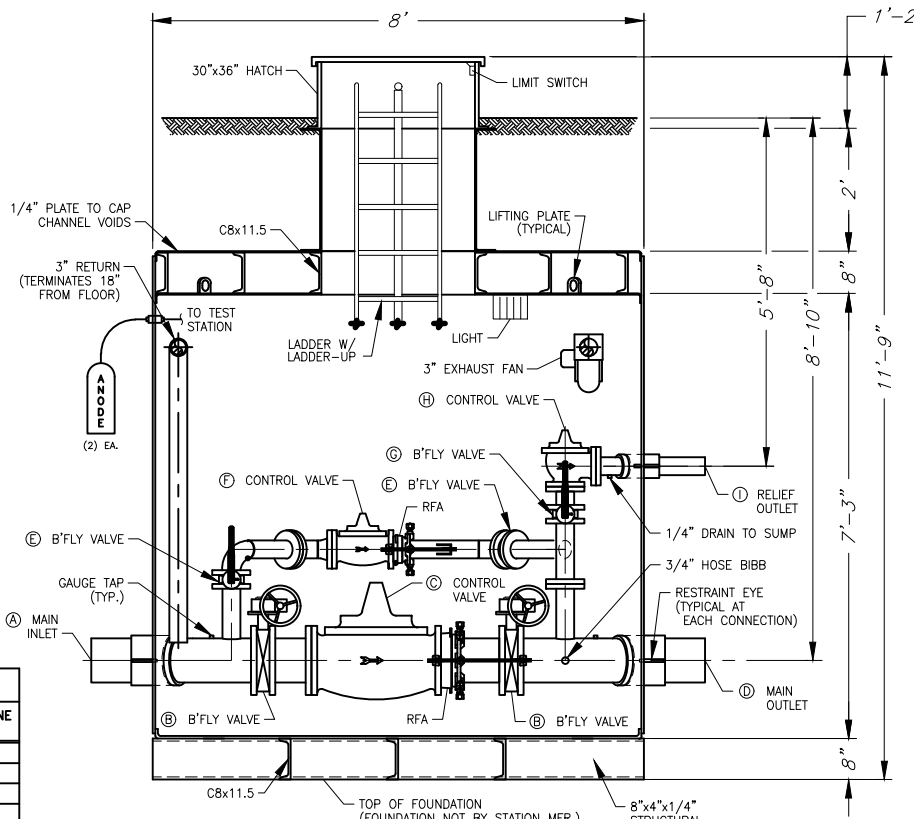
INTERIOR PLAN

COMPONENT SIZE SCHEDULE			
DESCRIPTION	8" LINE SIZE	10" LINE SIZE	
A MAIN INLET	6"	8"	
B BUTTERFLY VALVE	6"	8"	
C CONTROL VALVE*	6"	8"	
D MAIN OUTLET	6"	8"	
E BUTTERFLY VALVE	3"	3"	
F CONTROL VALVE*	3"	3"	
G BUTTERFLY VALVE	3"	3"	
H PRESSURE RELIEF VALVE	3"	3"	
I RELIEF VALVE OUTLET	3"	3"	

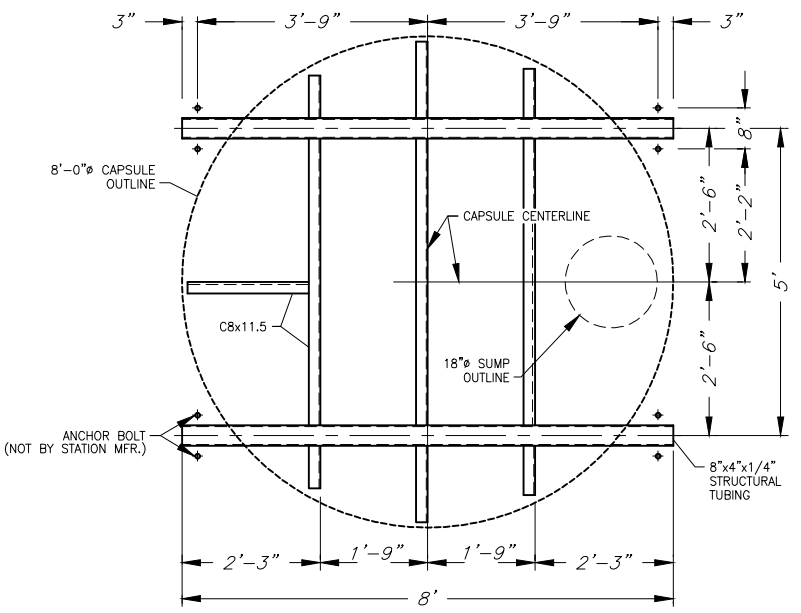
TERMINATE WITH CORROSION RESISTANT #4 MESH SCREEN WITH 1/2-INCH MINIMUM CLEARANCE TO OUTLET FLOOD RIM.

* C AND F CONTROL VALVES WILL BE PRESSURE REDUCING OR ELECTRONIC CONTROL VALVES AS DETERMINED ON A PROJECT-BY-PROJECT BASIS.

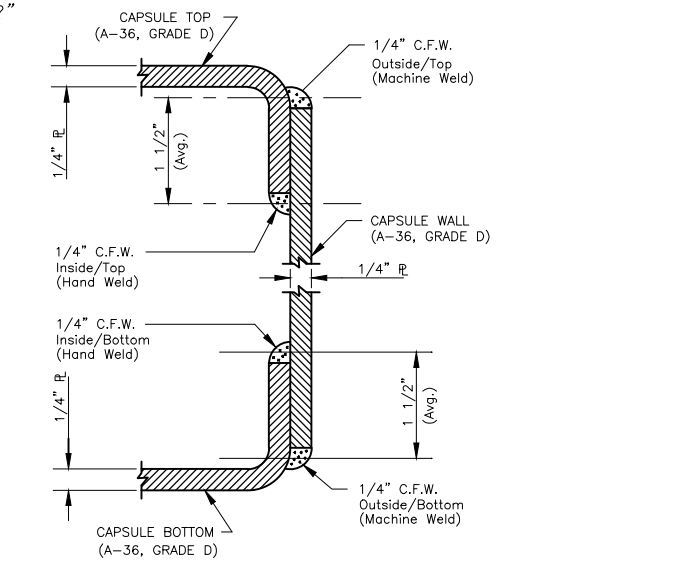
NOTE: CAPSULE DESIGNED FOR H2O TRAFFIC LOADING HATCH IS NOT H2O RATED



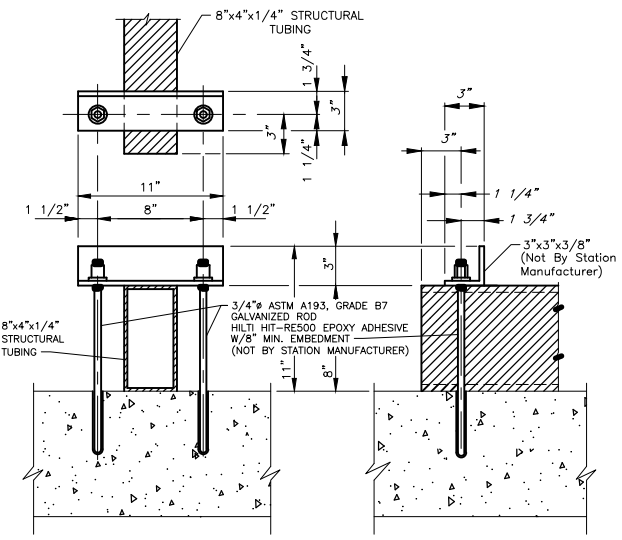
SECTION A-A



SKID PLAN



LAP JOINT CONNECTION OF CAPSULE WALL PLATE WITH FLANGE TOP AND BOTTOM



TYPICAL ANCHOR DETAIL

NOTES: ANCHOR ANGLE, BOLTS, NUTS, & ADHESIVE CAPSULE NOT BY STATION MFR. CONCRETE MUST HAVE A MINIMUM F_c OF 3500 PSI FOR PROPER ANCHORAGE.

- NOTES:**
- ENGINEER'S STAMP AFFIXED HERETO IS ONLY FOR THE PURPOSE OF IDENTIFYING THIS PRODUCT AS THE CITY STANDARD.
 - CHANGES TO THIS DETAIL WILL OCCASIONALLY BE MADE BY THE MANUFACTURER AT THEIR DISCRETION OR UNDER THE DIRECTION OF THE CITY ENGINEER OR PUBLIC WORKS DEPARTMENT.
 - CONCRETE FOUNDATION SLAB DETAILS TO BE PROVIDED BY THE CONTRACTOR AND APPROVED BY THE CITY ENGINEER.

NOTE: RFA - RESTRAINED FLANGE ADAPTER
This drawing is conceptual and does not reveal certain details and manufacturing processes required to successfully build the equipment. As such, Engineered Fluid, Inc. is not responsible for injury or damages caused by any unauthorized fabrication or assembly using all or any part of this drawing.

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CONTROL VALVE STATION
NORTH OGDEN, UTAH

JOB REF. NO. DRWG. NO. TYPNORTHOGDENCVS

NO.	REVISION	DATE

<p>DESIGNED BY O. CURTIS</p> <p>DRAWING SCALE N.T.S.</p> <p>ISSUE DATE 8/31/2022</p>	<p>PROJECT MANAGER A. THOMPSON</p> <p>CHECKED BY A. THOMPSON</p> <p>PRINCIPAL M. CHANDLER</p>
--	---

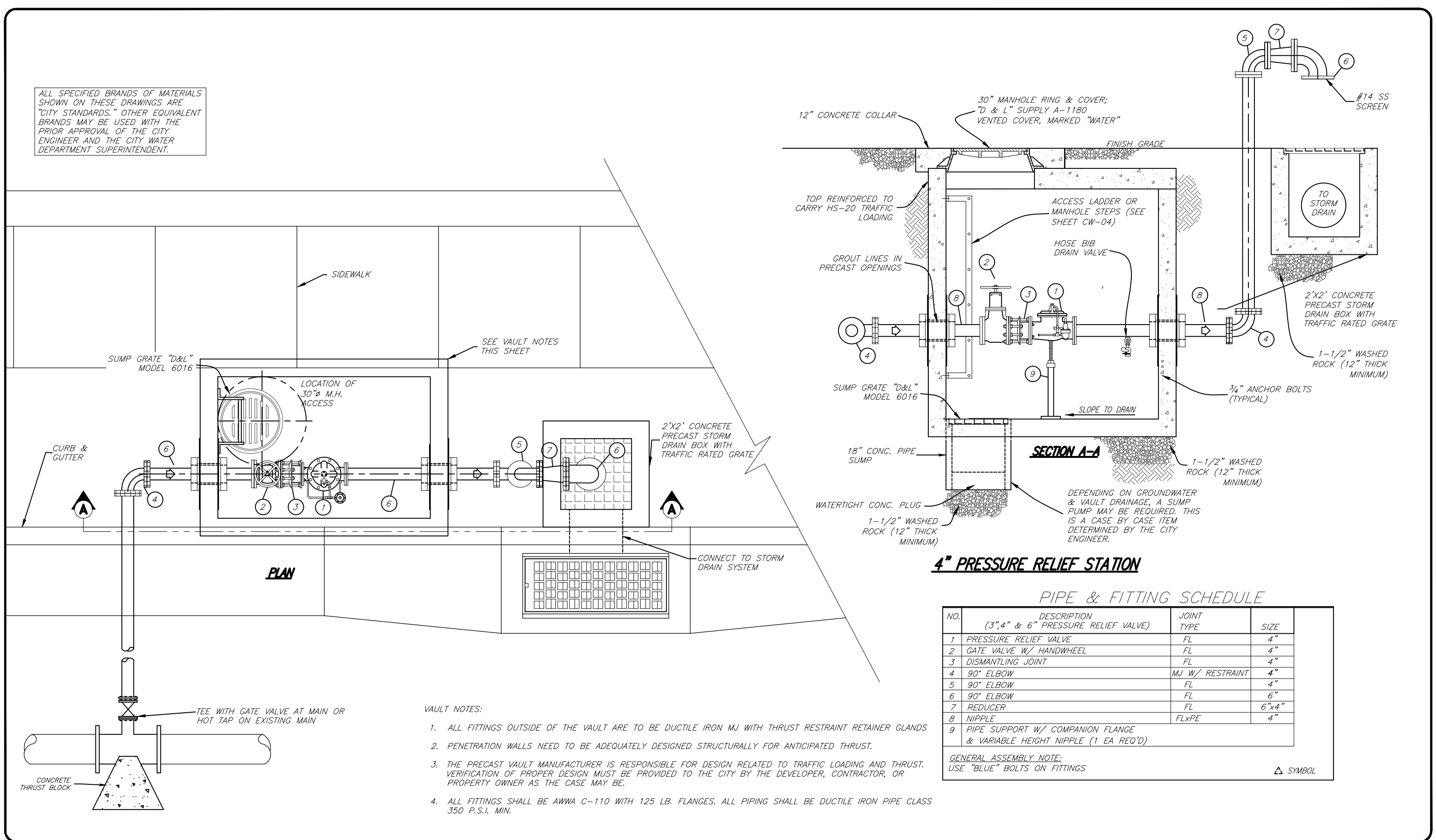
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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
CULINARY WATER - PRESSURE REDUCTION STATION

PROJECT NUMBER 2020-0125	SHEET 18	OF 58
SHEET NUMBER CW- Page 33		

ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER AND THE CITY WATER DEPARTMENT SUPERINTENDENT.



4" PRESSURE RELIEF STATION

PIPE & FITTING SCHEDULE

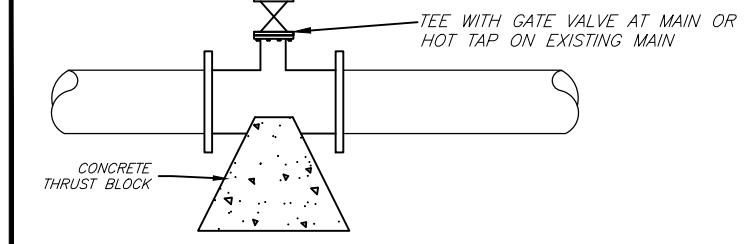
NO.	DESCRIPTION (3", 4" & 6" PRESSURE RELIEF VALVE)	JOINT TYPE	SIZE
1	PRESSURE RELIEF VALVE	FL	4"
2	GATE VALVE W/ HANDWHEEL	FL	4"
3	DISMANTLING JOINT	FL	4"
4	90° ELBOW	MJ W/ RESTRAINT	4"
5	90° ELBOW	FL	4"
6	90° ELBOW	FL	6"
7	REDUCER	FL	6"x4"
8	NIPPLE	FLxPE	4"
9	PIPE SUPPORT W/ COMPANION FLANGE & VARIABLE HEIGHT NIPPLE (1 EA REQ'D)		

GENERAL ASSEMBLY NOTE:
USE "BLUE" BOLTS ON FITTINGS

△ SYMBOL

VAULT NOTES:

1. ALL FITTINGS OUTSIDE OF THE VAULT ARE TO BE DUCTILE IRON MJ WITH THRUST RESTRAINT RETAINER GLANDS
2. PENETRATION WALLS NEED TO BE ADEQUATELY DESIGNED STRUCTURALLY FOR ANTICIPATED THRUST.
3. THE PRECAST VAULT MANUFACTURER IS RESPONSIBLE FOR DESIGN RELATED TO TRAFFIC LOADING AND THRUST. VERIFICATION OF PROPER DESIGN MUST BE PROVIDED TO THE CITY BY THE DEVELOPER, CONTRACTOR, OR PROPERTY OWNER AS THE CASE MAY BE.
4. ALL FITTINGS SHALL BE AWWA C-110 WITH 125 LB. FLANGES. ALL PIPING SHALL BE DUCTILE IRON PIPE CLASS 350 P.S.I. MIN.



NO.	DESCRIPTION	DATE

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
CULINARY WATER - PRESSURE RELIEF VALVE

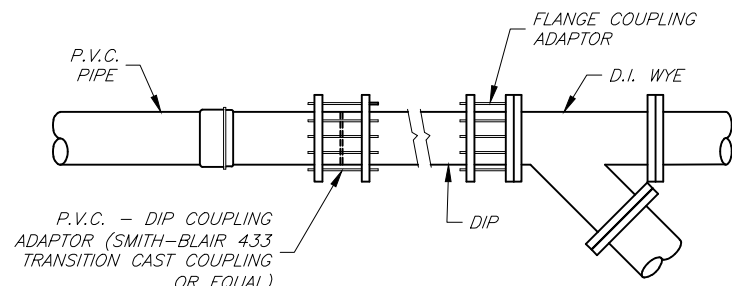
PROJECT NUMBER 2020-0125
SHEET 19 OF 58
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SANITARY SEWER STANDARD DRAWINGS - APPROVED MATERIALS

<i>SANITARY SEWER</i>		
<i>PART</i>	<i>APPROVED MATERIAL</i>	<i>STANDARD DRAWING</i>
<i>PVC -DIP COUPLING ADAPTOR</i>	<i>SMITH-BLAIR 433</i>	<i>SS-02</i>
<i>MANHOLE RING AND COVER</i>	<i>D&L A-1180</i>	<i>SS-02</i>
<i>MANHOLE STEPS</i>	<i>M.A. INDUSTRIES PS1-PF</i>	<i>SS-02</i>

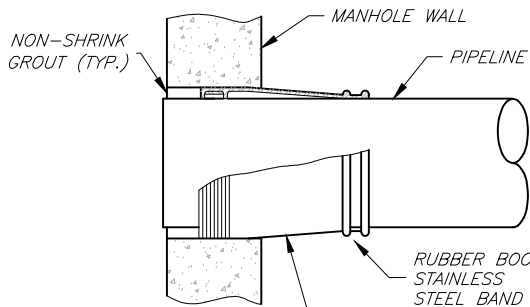
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<p style="font-size: x-small;">RECORD OF REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>																																	<p style="font-size: x-small;">PRINCIPAL M. CHANDLER</p> <p style="font-size: x-small;">PROJECT MANAGER A. THOMPSON</p> <p style="font-size: x-small;">CHECKED BY A. THOMPSON</p> <p style="font-size: x-small;">DRAWN BY O. CURTIS</p> <p style="font-size: x-small;">DRAWING SCALE N.T.S.</p> <p style="font-size: x-small;">ISSUE DATE 9/1/2022</p>	 <p style="font-weight: bold; font-size: large;">CRS ENGINEERS</p> <p>Answers to Infrastructure®</p> <p style="font-size: x-small;">4246 S Riverboat Rd, Ste 200 Salt Lake City, UT 84123 P: 801.359.5565 www.crsengineers.com</p>	<p style="font-size: x-small;">NORTH OGDEN CITY CORPORATION PUBLIC WORKS STANDARDS SANITARY SEWER - APPROVED MATERIALS</p>	<p style="font-size: x-small;">PROJECT NUMBER 2020-0125</p> <p style="font-size: x-small;">SHEET 20 OF 58</p> <p style="font-size: x-small;">SHEET NUMBER SS-0</p>	<p>Page 35</p>



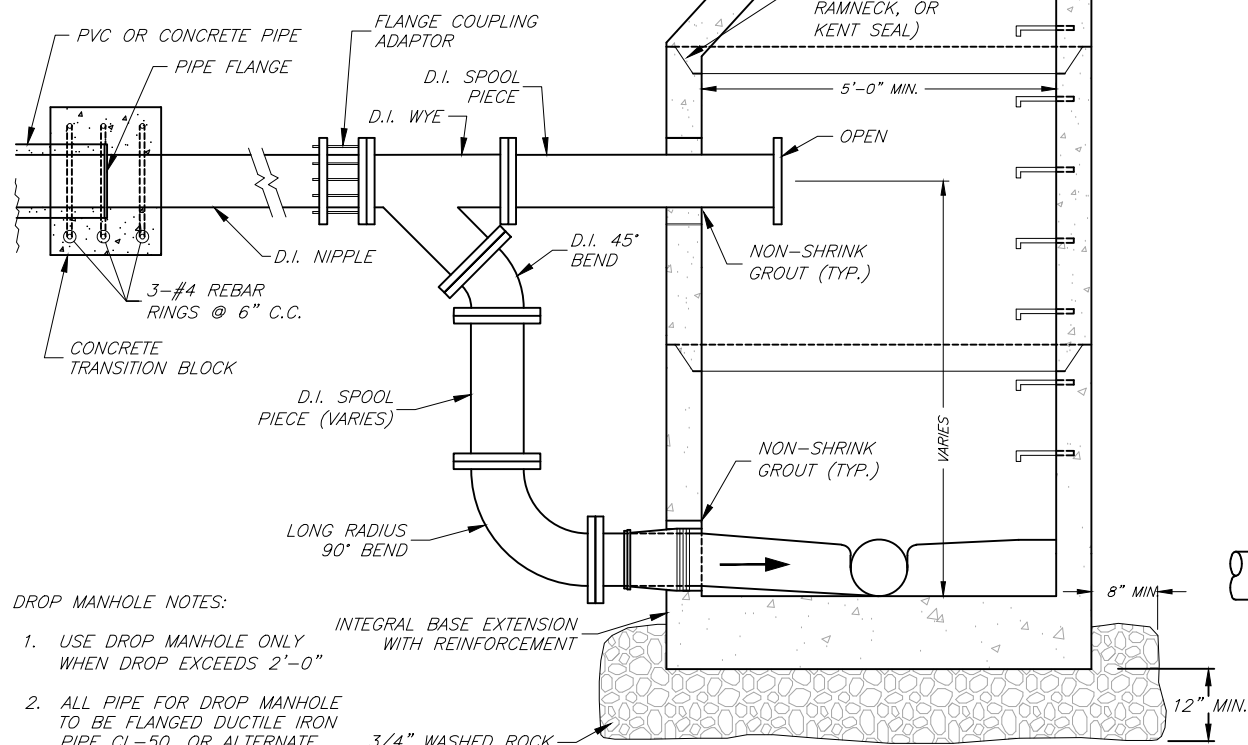
P.V.C. - DIP COUPLING ADAPTOR (SMITH-BLAIR 433 TRANSITION CAST COUPLING OR EQUAL)

TYPICAL CONNECTION
DUCTILE IRON TO PVC PIPE



RUBBER BOOT DETAIL

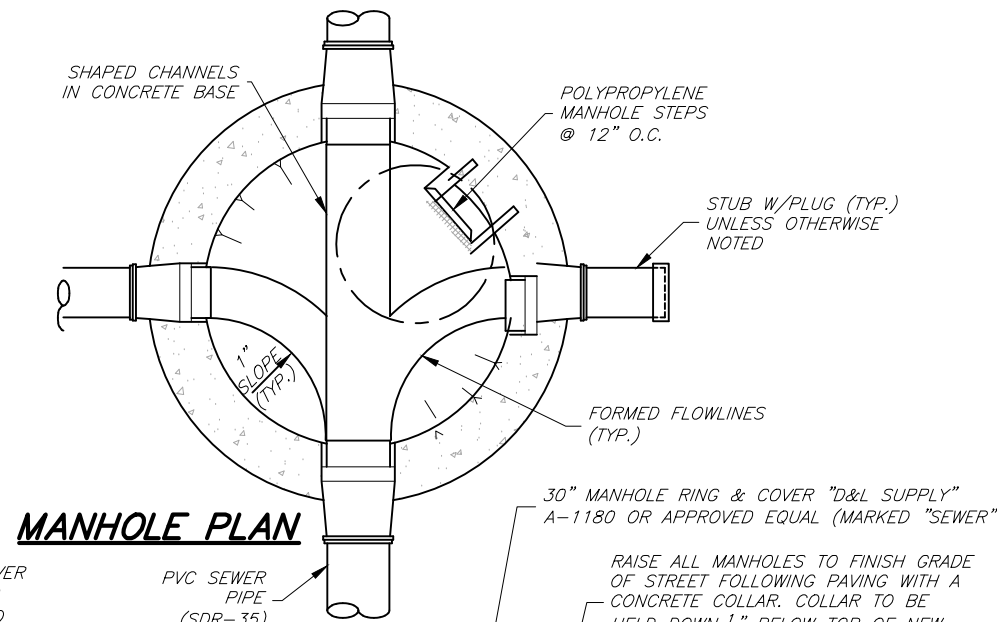
SEWER MANHOLE SPACING	
PIPE GRADE (%)	MAXIMUM MANHOLE SPACING (FT)
LESS THAN 8%	300
8% TO 10%	200
10% TO 12%	175
ABOVE 12%	AS APPROVED BY ENGINEER



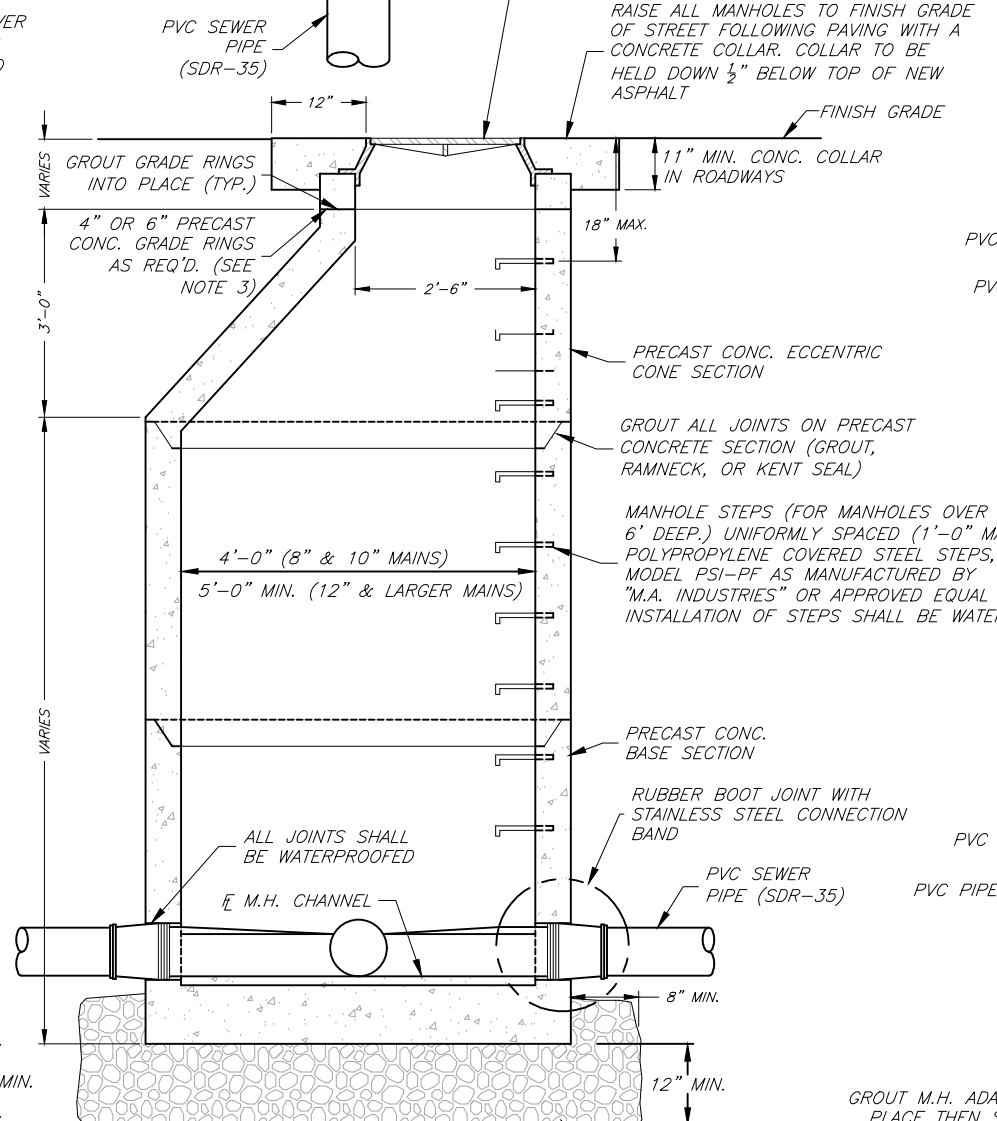
DROP MANHOLE NOTES:

- USE DROP MANHOLE ONLY WHEN DROP EXCEEDS 2'-0"
- ALL PIPE FOR DROP MANHOLE TO BE FLANGED DUCTILE IRON PIPE CL-50, OR ALTERNATE SCH. 40 PVC ENCASED IN CONCRETE.

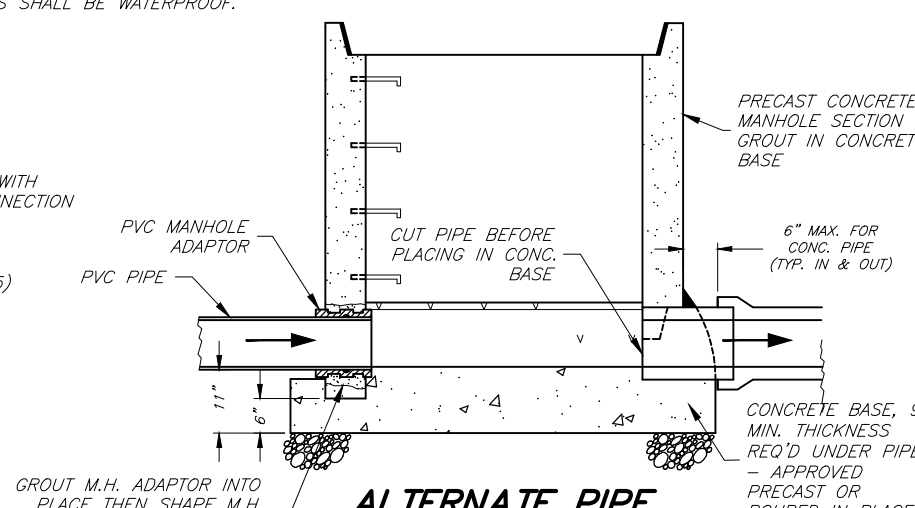
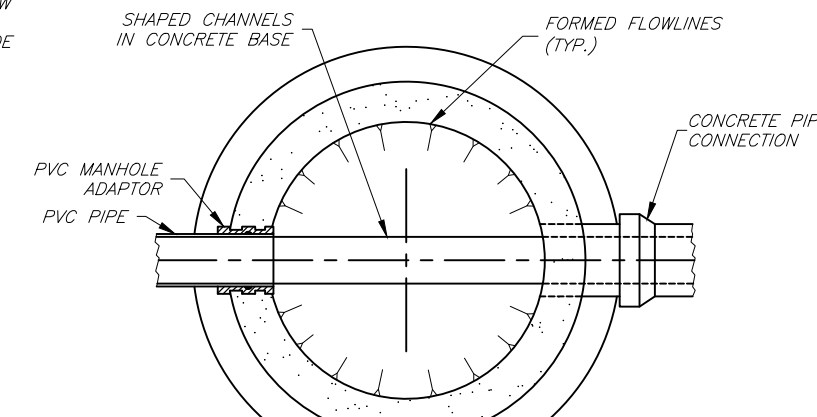
TYPICAL DROP MANHOLE SECTION



MANHOLE PLAN



TYPICAL MANHOLE SECTION



ALTERNATE PIPE CONNECTION DETAIL

GENERAL NOTES:

- SECURE INVERTS IN ALL MANHOLES DURING CONSTRUCTION SO AS TO PREVENT GRAVEL AND OTHER DEBRIS FROM COLLECTING INSIDE.
- A LARGER DIAMETER MANHOLE MAY BE REQUIRED BY THE DESIGN ENGINEER AFTER EVALUATION OF THE NUMBER, SIZE, AND ANGLE OF THE PIPES THAT CONNECT TO THE MANHOLE.
- NO MORE THAN 12" OF GRADE RINGS TO BE ALLOWED ON ANY MANHOLE.
- ALL TERMINATING SEWER MAINS SHALL END WITH A CITY STANDARD MANHOLE.
- SERVICE LATERAL CONNECTIONS SHALL NOT BE ALLOWED IN SEWER MANHOLES.
- ALL SANITARY SEWER LINES SHALL BE INSPECTED BY MEANS OF VIDEO CAMERA AND AIR TESTED WHEN CONSTRUCTED.
- MANHOLES SHALL BE LOCATED INSIDE OF THE RIGHT-OF-WAY AND ACCESSIBLE BY CLEANING EQUIPMENT AND TRUCKS.
- ALL SEWER MAINS WILL BE GROUTED WHERE THEY ENTER OR EXIT MANHOLES.

NO.	DESCRIPTION	DATE
7.		

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
SANITARY SEWER - TYPICAL MAHOLES AND DETAILS

PROJECT NUMBER 2020-0125
SHEET 22 OF 58
SHEET NUMBER SS-0
Page 37

STORM DRAIN STANDARD DRAWINGS - APPROVED MATERIALS

STORM DRAIN		
PART	APPROVED MATERIAL	STANDARD DRAWING
CATCH BASIN GRATE AND FRAME	D&L I-1803	SD-01, SD-02, SD-03
DRAINAGE FABRIC	GEOTEX 401	SD-02
CANAL GATE	WATERMAN C-10F	SD-03
MANHOLE RING AND COVER	D&L A-1180	SD-03
MANHOLE STEPS	M.A. INDUSTRIES PS1-PF	SD-03
30" MANHOLE RING AND COVER	D&L A-1181	SD-04
SILT FENCE - FILTER FABRIC	MIRAFI 140N, DUPONT TYPAR 3341	SD-05

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NO.	DATE	DESCRIPTION

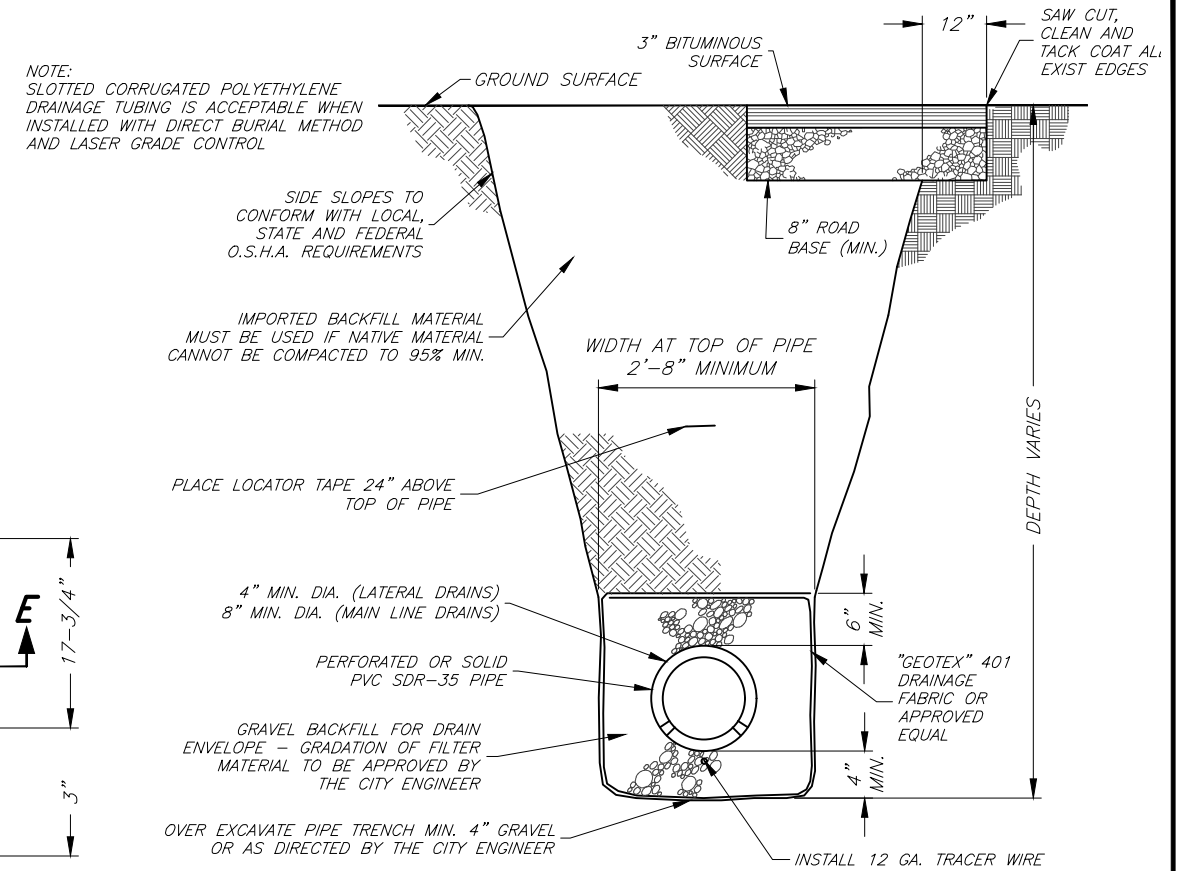
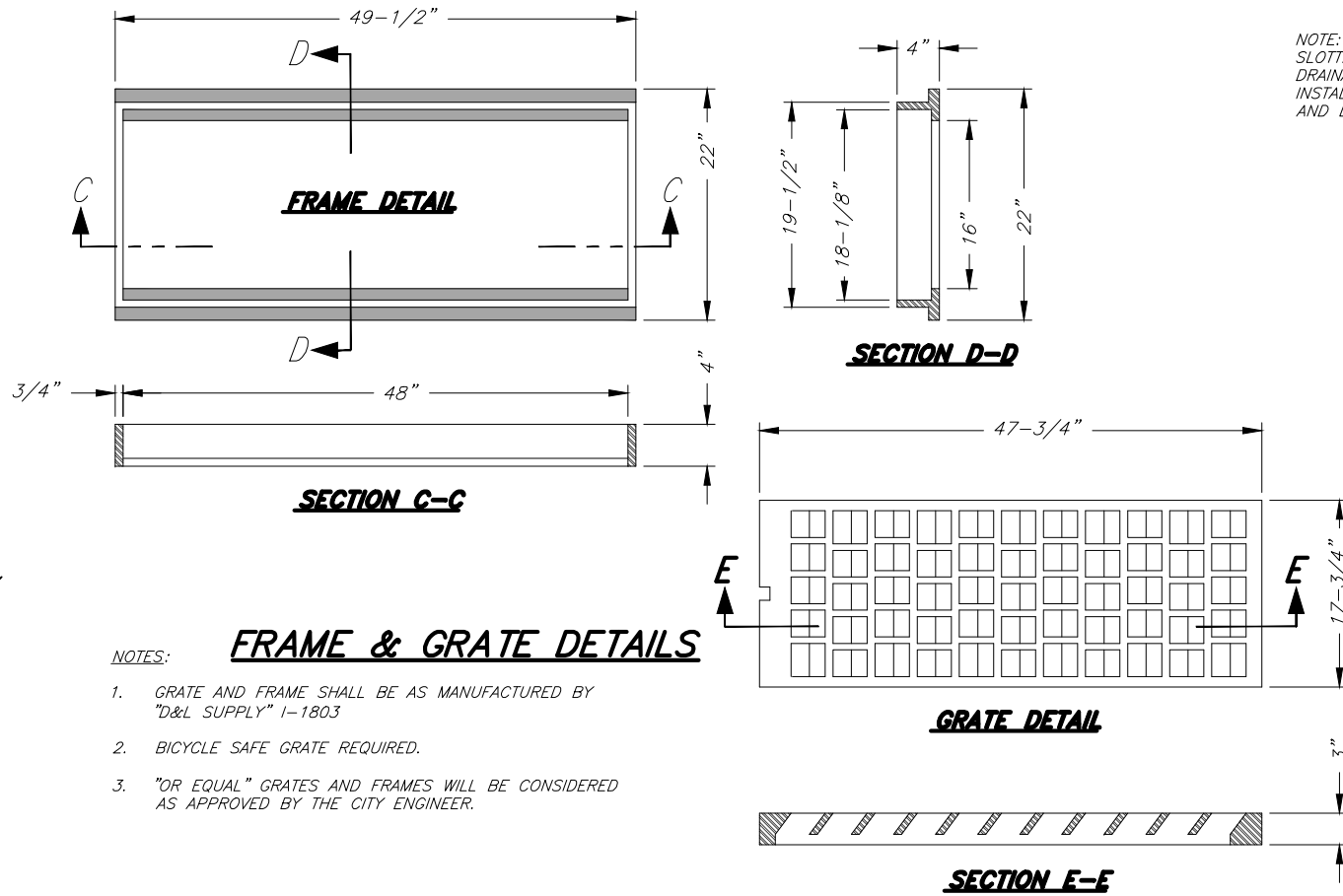
PRINCIPAL
 M. CHANDLER
 PROJECT MANAGER
 A. THOMPSON
 CHECKED BY
 A. THOMPSON
 DRAWN BY
 O. CURTIS
 DRAWING SCALE
 N.T.S.
 ISSUE DATE
 9/1/2022



NORTH OGDEN CITY CORPORATION
 PUBLIC WORKS STANDARDS
 STORM DRAIN - APPROVED MATERIALS

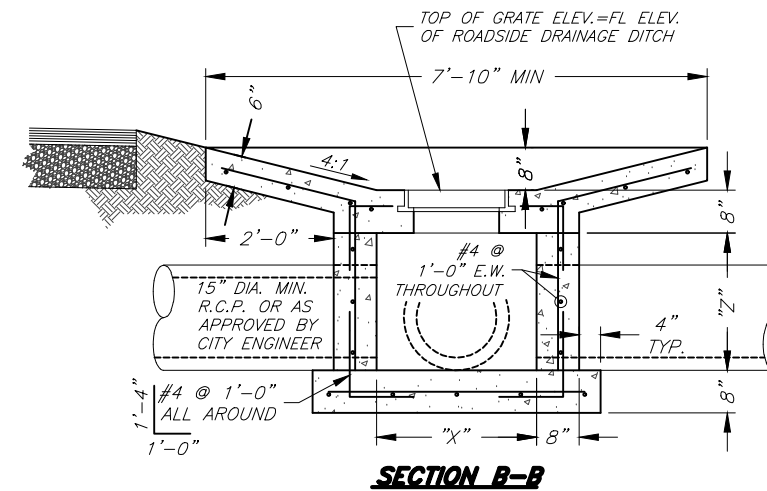
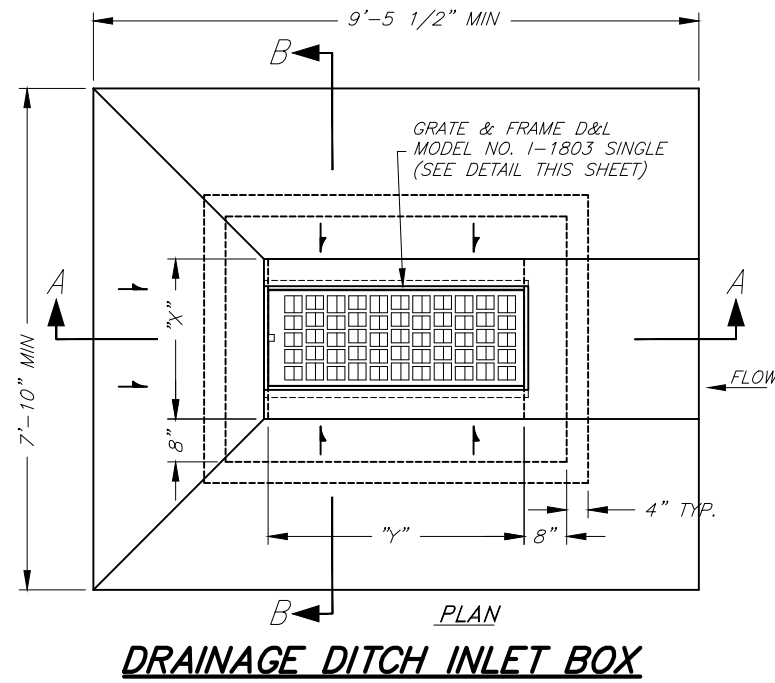
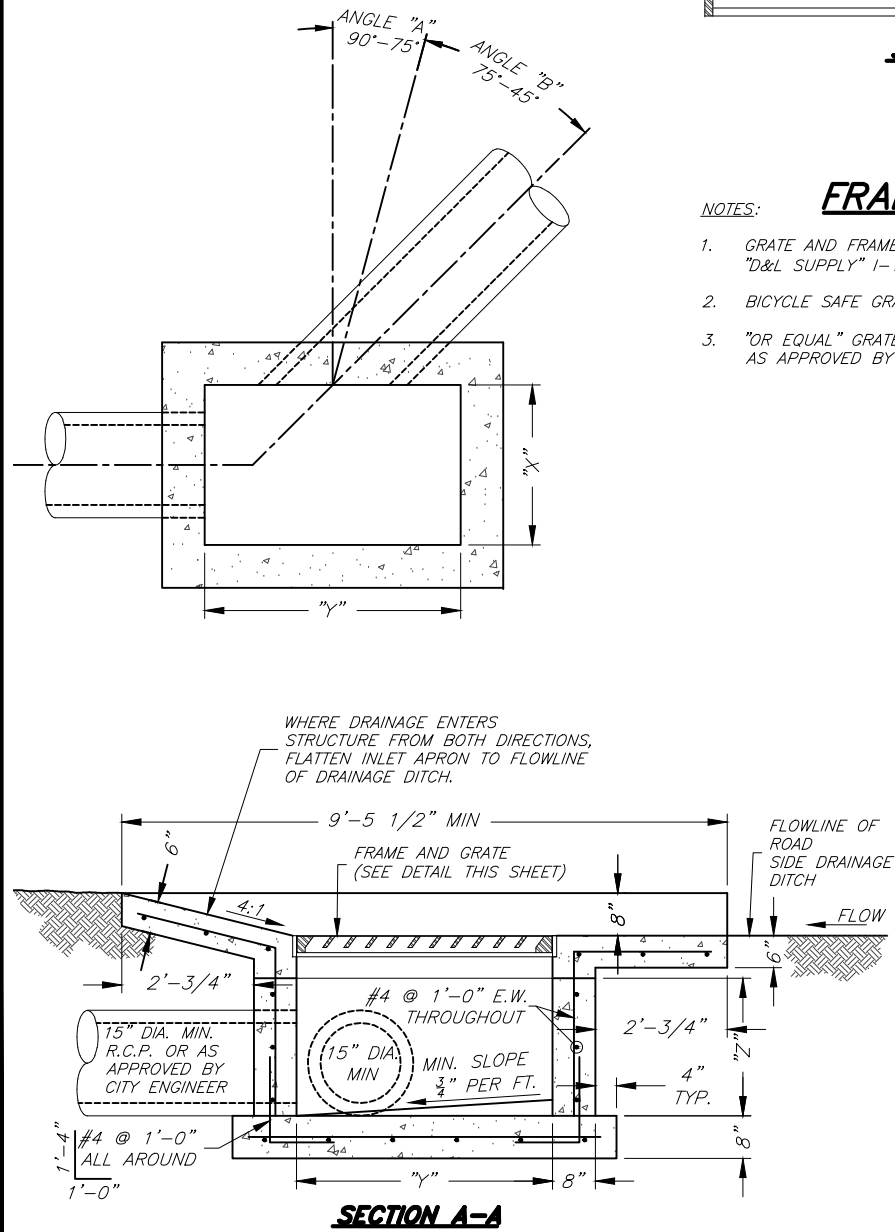
PROJECT NUMBER
 2020-0125
 SHEET
 23 OF 58
 SHEET NUMBER
 SD-0

PIPE SIZE (IN.)	INLET BOX			"Z" MIN.
	"X"	"Y" (ANGLE A)	"Y" (ANGLE B)	
15	2'-6"	4'-0"	4'-0"	2'-0"
18	2'-6"	4'-0"	4'-0"	2'-6"
21	4'-0"	4'-0"	4'-0"	3'-0"
24	4'-0"	4'-0"	5'-0"	3'-0"
30	4'-0"	4'-0"	6'-0"	3'-6"
36	4'-0"	4'-0"	6'-0"	4'-0"
42	6'-0"	6'-0"	7'-0"	5'-0"
48	6'-0"	6'-0"	8'-0"	5'-6"



LAND DRAIN NOTES:

- LAND DRAIN MANHOLES, MAIN LINES, AND SERVICES SHALL BE CONSTRUCTED TO THE SAME STANDARDS AS SEWER MANHOLES, MAIN LINES, AND SERVICES. LAND DRAIN COLLECTION MAINS SHALL BE WHITE 8 INCH MINIMUM DIAMETER WATER TIGHT JOINT P.V.C. SDR 35 SEWER PIPE. LAND DRAIN SERVICE LATERALS SHALL BE WHITE 4 INCH DIAMETER WATER TIGHT JOINT P.V.C. SDR 35 PIPE.
- LAND DRAIN LINES SHALL BE MARKED WITH 2" BROWN DETECTABLE WARNING TAPE AND TRACER WIRE.
- IN SPECIAL CASES OPEN JOINT/PERFORATED LAND DRAIN MAIN LINES MAY BE USED IF APPROVED BY THE CITY ENGINEER. OPEN JOINT LAND DRAIN INSTALLATION SHALL FOLLOW THE DETAIL ABOVE.
- MANHOLES SHALL BE LOCATED INSIDE OF THE RIGHT-OF-WAY AND ACCESSIBLE BY CLEANING EQUIPMENT AND TRUCKS. ACCESS ROAD LOCATION, SURFACING AND DESIGN SHALL BE DETERMINED BY THE CITY.
- ALL STORM DRAIN AND LAND DRAIN LINES SHALL BE INSPECTED BY MEANS OF VIDEO CAMERA WHEN CONSTRUCTED.



NOTES:

- ALL CATCH BASIN BOX SIZES REFLECT DIMENSIONS FOR THE MINIMUM 15"Ø PIPE SIZE. BOX DIMENSIONS MUST INCREASE PROPORTIONALLY TO ACCOMMODATE LARGER PIPE SIZES. (SEE TABLE THIS SHEET)
- CAST-IN-PLACE CONCRETE CATCH BASINS CAN BE REPLACED WITH PRECAST CONCRETE CATCH BASINS WITH HS-20 DECK LOADING AND COMPARABLE SIZE.
- ALL BOXES SHALL BE FORMED ON THE INSIDE AND OUTSIDE OF THE BOX AND INSPECTED BY THE CITY PRIOR TO THE PLACING OF CONCRETE.

NO.	DATE	DESCRIPTION

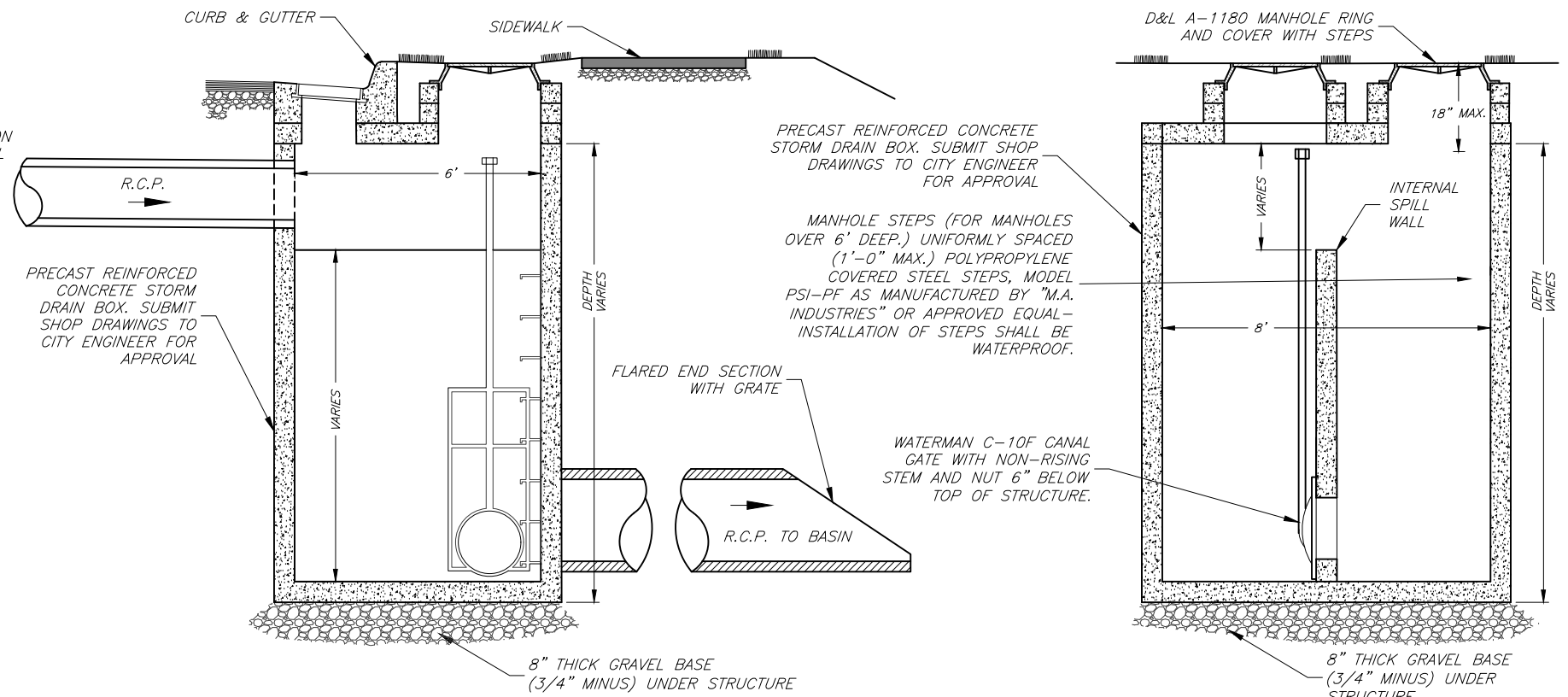
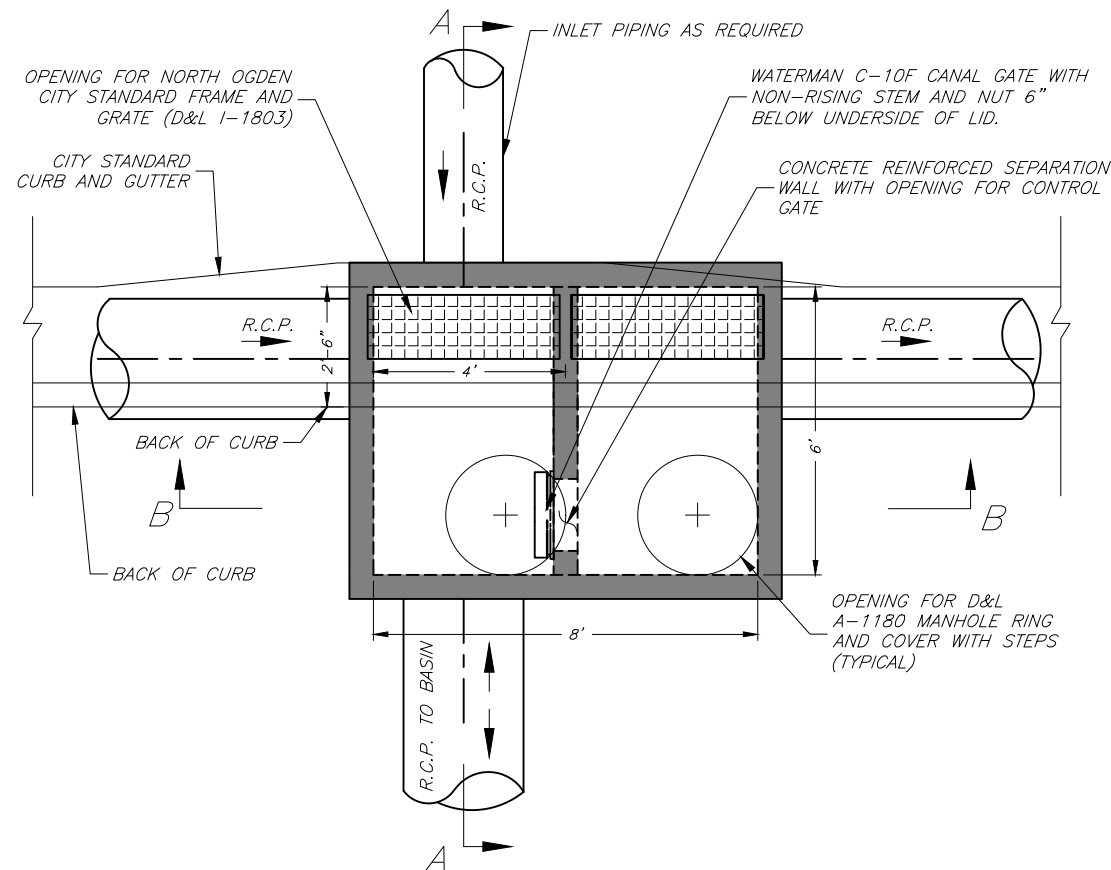
PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
STORM DRAIN - DRAINAGE DITCH INLET BOX, GENERAL GRATE AND FRAME, & SUBSURFACE DRAIN DETAILS

PROJECT NUMBER 2020-0125
SHEET 25 OF 58
SHEET NUMBER SD-C



SECTION A-A

SECTION B-B

6'x8' INLET-OUTLET CONTROL STRUCTURE PLAN

STRUCTURAL NOTES:

1. REINFORCEMENT TO CONFORM WITH ASTM A 615 GRADE 60
2. HS-20 LOADING
3. CONCRETE SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI
4. USE AN AIR-ENTRAINING AGENT ON ALL CONCRETE EXPOSED TO FROST.

GENERAL NOTE:

IT IS UNDERSTOOD THAT THIS CONTROL STRUCTURE DETAIL MAY NOT BE APPLICABLE TO ALL SITUATIONS. THIS RECOMMENDED DETAIL SHOULD BE FOLLOWED AS MUCH AS PRACTICAL. VARIATIONS CAN BE APPROVED BY THE PUBLIC WORKS DEPARTMENT AND CITY ENGINEER.

NO.	DESCRIPTION	DATE

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

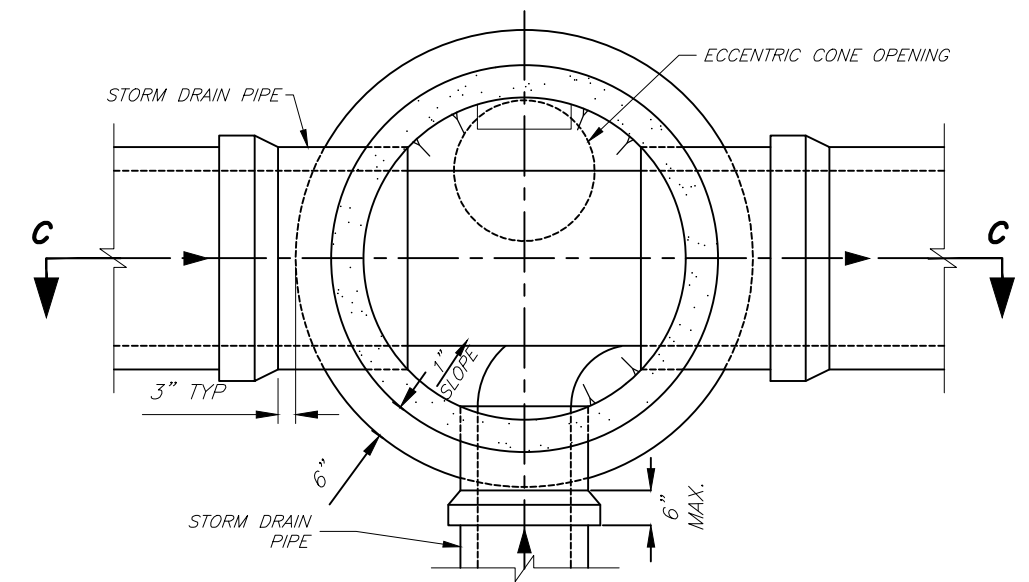
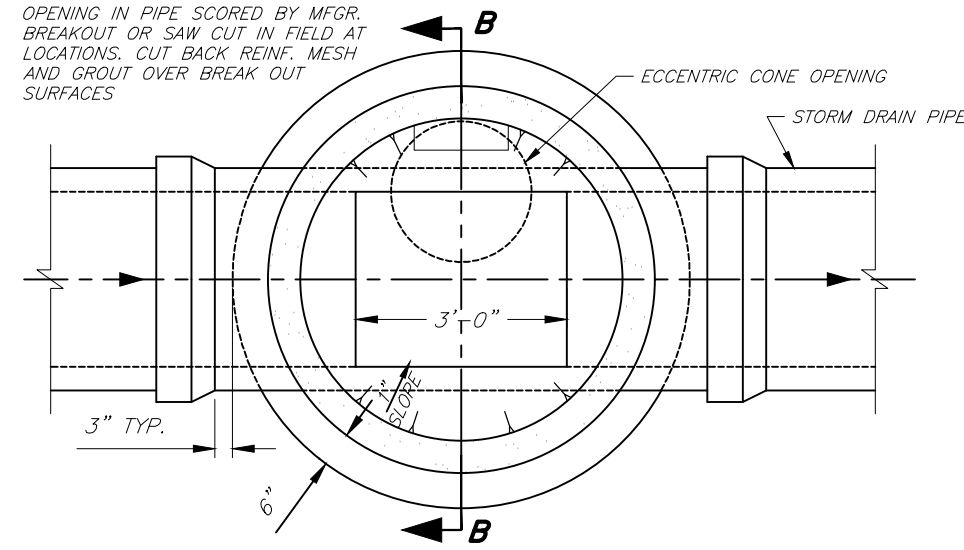
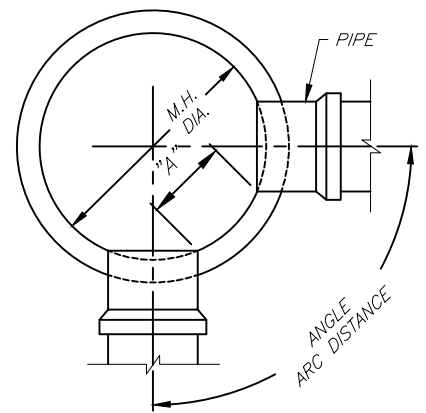
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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
STORM DRAIN - CONTROL STRUCTURE DETAILS

PROJECT NUMBER 2020-0125	
SHEET 26	OF 58
SHEET NUMBER SD-C	

PIPE SIZES		JUNCTION MANHOLE (ANGLE / ARC DISTANCE)										
M.H. SIZE	IN-LINE M.H. 180'	90°	85°	80°	75°	70°	65°	60°	55°	50°	45°	
4" M.H.	15"-24"	15"-18"	15"-18"	15"	15"	---	---	---	---	---	---	---
5" M.H.	27"-30"	21"-24"	21"-24"	18"-21"	18"-21"	15"-18"	15"-18"	15"	---	---	---	---
6" M.H.	36"-48"	27"-30"	27"-30"	24"-27"	24"	21"-24"	21"	18"	15"-18"	15"	---	---
7" M.H.	54"	36"	36"	30"	27"-30"	27"	24"	21"-24"	21"	18"	15"	---
8" M.H.	60"	42"	42"	36"	30"	27"-30"	27"	24"	21"	18"	15"	---

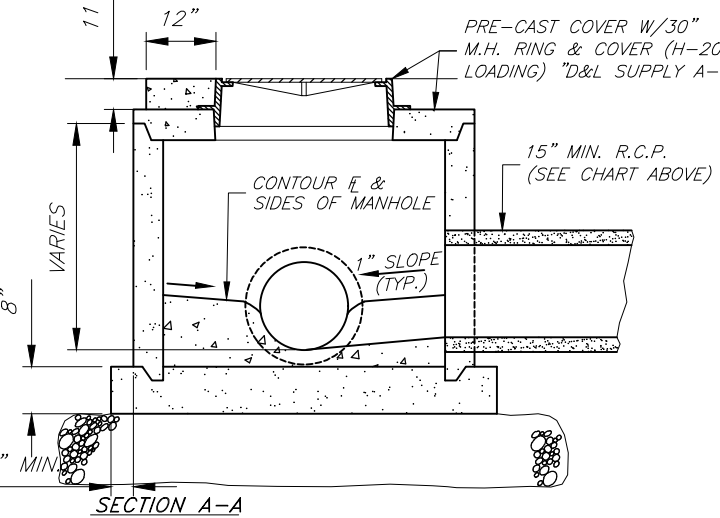
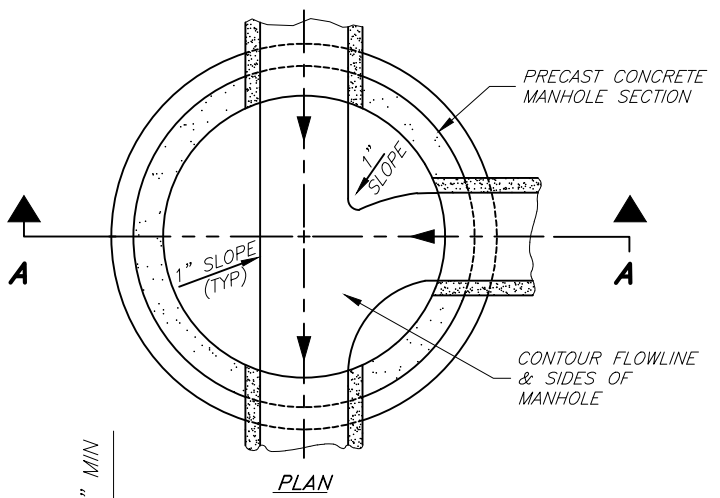
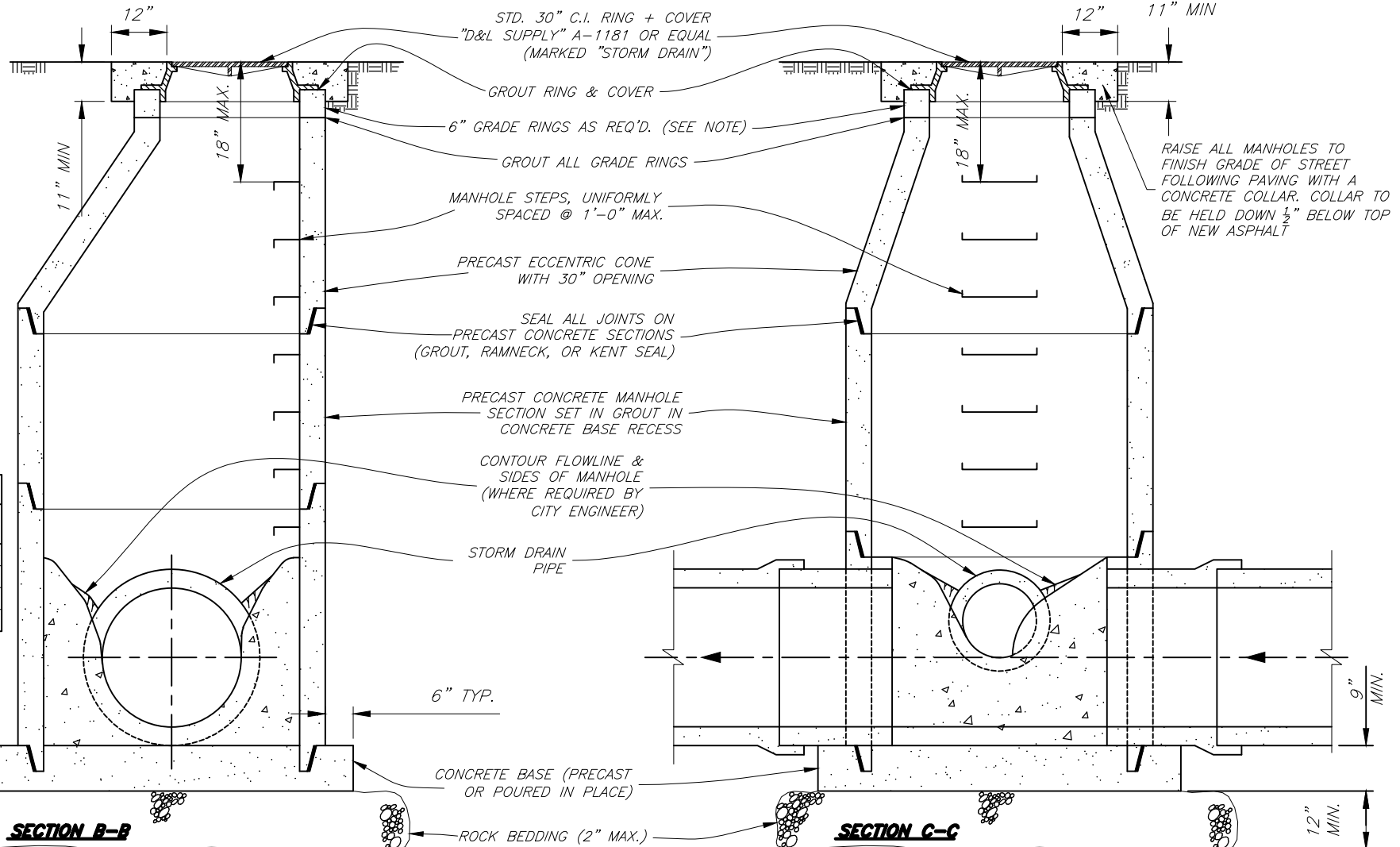
- SIZING NOTES:**
- SUGGESTED "A" DISTANCE IS 6" OR GREATER FOR 48", 60" AND 72" DIAMETER MANHOLES
 - SUGGESTED "A" DISTANCE IS 8" OR GREATER FOR 84" AND 96" DIAMETER MANHOLES



TYPICAL LINE MANHOLE

TYPICAL JUNCTION MANHOLE

- GENERAL NOTES:**
- STORM DRAIN MANHOLE DIAMETER TO BE DETERMINED BY THE DESIGN ENGINEER AFTER EVALUATION OF THE NUMBER, SIZE, AND PIPE ENTRY ANGLE OF THE PIPES THAT CONNECT TO THE MANHOLE.
 - NO MORE THAN 12" OF GRADE RINGS TO BE ALLOWED ON ANY MANHOLE
 - PLYWOOD COVERS SHALL BE USED AT MANHOLE FLOOR TO COVER FLOWLINE DURING CONSTRUCTION AND MAINTENANCE ACTIVITIES.
 - ALL INTERIOR JOINTS SHALL BE SMOOTH AND EVENLY GROUTED WITH NON-SHRINK GROUT MIX.
 - MANHOLE STEPS UNIFORMLY SPACED (1'-0" MAX.) POLYPROPYLENE COVERED STEEL STEPS, MODEL PSI-PF AS MANUFACTURED BY "M.A. INDUSTRIES" OR APPROVED EQUAL - INSTALLATION OF STEPS SHALL BE WATERPROOF.



CLEANOUT MANHOLE

STORM DRAIN MANHOLE SPACING	
PIPE GRADE (%)	MAXIMUM MANHOLE SPACING (FT)
LESS THAN 8%	300
8% TO 10%	200
10% TO 12%	175
ABOVE 12%	AS APPROVED BY ENGINEER

NO.	DESCRIPTION	DATE

PROJECT NUMBER PROJECT MANAGER CHECKED BY DRAWN BY DRAWING SCALE ISSUE DATE	M. CHANDLER A. THOMPSON A. THOMPSON O. CURTIS N.T.S. 8/31/2022
--	---

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
STORM DRAIN - MANHOLE DETAILS

PROJECT NUMBER	2020-0125
SHEET	27 OF 58
SHEET NUMBER	SD-C

GENERAL NOTES AND PROCEDURES FOR CONSTRUCTION SITE ACTIVITIES:

SECTION 1 – GENERAL REQUIREMENTS: PREVENTATIVE MEASURES SHALL BE TAKEN TO MINIMIZE OR ELIMINATE THE DISCHARGE OF POLLUTED STORM WATER INTO OFFSITE STORM DRAIN FACILITIES. OFFSITE FACILITIES SHALL INCLUDE BUT NOT BE LIMITED TO ROADWAYS, COLLECTION BOXES, CHANNELS, DITCHES, BASINS, LAKES, STREAMS, ETC. BY LAW THE CONTRACTOR SHALL KEEP A COPY OF THE POLLUTION PREVENTION PLAN ON SITE AND MAKE IT AVAILABLE UPON REQUEST TO A REPRESENTATIVE OF THE REGIONAL WATER BOARD OR OTHER RELATED AGENCIES.

SECTION 2 – POLLUTANTS: SEDIMENT IN STORM WATER IS THE PRIMARY POLLUTANT OF CONCERN FOR CONSTRUCTION ACTIVITIES. OTHER POLLUTANTS INCLUDING HEAVY METALS, NUTRIENTS, OILS, FUELS, AND ADDITIONAL TOXICS (CONSTRUCTION MATERIALS AND CHEMICALS) ARE OFTEN FOUND IN RUNOFF WATERS FROM CONSTRUCTION SITES.

SECTION 3 – PREVENTATIVE MEASURES: PREVENTATIVE MEASURES SHALL BE A PART OF ANY CONSTRUCTION ACTIVITY THAT MAY LEAD TO THE POLLUTION OF OFFSITE STORM WATER. THE FOLLOWING CONSTRUCTION ACTIVITIES SHALL BE ADDRESSED BY THE CONTRACTOR IN ORDER TO MINIMIZE OR ELIMINATE POLLUTED STORM WATER:

- A. CLEARING AND GRUBBING CAN EXPOSE SOIL TO EROSION BY WIND AND WATER.
 - A.1. PROTECT AREAS EXPOSED TO WIND WITH EROSION CONTROL BLANKETS OR BY USING DUST ABATEMENT METHODS SUCH AS A WATERING TRUCK.
 - A.2. CREATE BERMS OR SWALES TO DIVERT RUNOFF AWAY FROM AREAS EXPOSED TO EROSION BY WATER.
 - A.3. STABILIZE SOILS THAT ARE UNAVOIDABLY EXPOSED TO RUNOFF SUCH AS RAIN BY USING EROSION CONTROL BLANKETS, TERRACING, OR PLANTING NEW VEGETATION.
 - A.4. BERMING AROUND EXPOSED AREAS CAN HELP CONTAIN RUNOFF AND PREVENT IT FROM ENTERING THE STORM DRAIN SYSTEM.
- B. EXCAVATION AND GRADING CAN ALSO EXPOSE SOIL TO EROSION BY WIND AND WATER.
 - B.1. PROTECT AREAS EXPOSED TO WIND AND WATER WITH THE METHODS MENTIONED ABOVE.
 - B.2. DUST CAN BE KNOCKED DOWN DURING EXCAVATION BY APPLYING WATER USING A HOSE AND NOZZLE.
- C. HAUL OR TRANSPORT OF MATERIALS OR WASTE TO OFFSITE DISPOSAL AREAS CAN RESULT IN TRACKING MUD ONTO ADJACENT CITY STREETS.
 - C.1. CONSTRUCT A STABILIZED CONSTRUCTION ENTRANCE TO MINIMIZE TRACKING DEBRIS ONTO CITY STREETS.
 - C.2. STREETS ARE TO BE SWEEPED WHERE TRACKING OCCURS.
- D. REFUELING EQUIPMENT AND BASIC EQUIPMENT MAINTENANCE ON SITE CAN ACCIDENTALLY POLLUTE OFFSITE STORM DRAIN FACILITIES IF SPILLS OCCUR.
 - D.1. MAINTAIN EQUIPMENT IN GOOD OPERATING CONDITION. FIX LEAKS OF FUEL, OIL, AND OTHER SUBSTANCES IMMEDIATELY.
 - D.2. WHERE ONSITE FUELING IS PERMITTED, DESIGNATE AN AREA WHERE SPILLS CAN BE CONTAINED. ALWAYS USE SECONDARY CONTAINMENT SUCH AS A DRAIN PAN OR DROP CLOTH TO CATCH SPILLS AND PREVENT SPREADING. THE AREA SHALL NOT BE LOCATED NEAR STREAMS, RIVERS, RESERVOIRS, WELLS, OR ADJACENT TO THE STORM WATER COLLECTION SYSTEM.
 - D.3. KEEP CLEANUP MATERIALS ON HAND TO ABSORB SPILLS. EDUCATE PERSONNEL ON PREVENTION AND CLEAN-UP TECHNIQUES. CLEAN UP SPILLS IMMEDIATELY AND REMEDY CAUSE.
 - D.4. EXCAVATE AND DISPOSE OF CONTAMINATED SOILS AS HAZARDOUS WASTE. CONTACT STATE AND LOCAL OFFICIALS FOR ANY SPILL OF REPORTABLE QUANTITY.
- E. ON SITE EQUIPMENT OR VEHICLE WASH DOWN IS ONLY TO BE USED TO REMOVE SEDIMENT BUILD UP ON MACHINERY.
- F. FORMING, PLACING AND POURING CONCRETE CAN BE A SOURCE OF POLLUTION TO THE STORM DRAIN SYSTEM.
 - F.1. OILS AND RELEASE AGENTS FOR CONCRETE FORMS SHOULD ONLY BE USED AS RECOMMENDED BY THE MANUFACTURER. DO NOT PERMIT THESE TO ENTER THE STORM DRAIN SYSTEM, ESPECIALLY STREAMS, LAKES AND RESERVOIRS.
 - F.2. USE A DESIGNATED AREA FOR CONCRETE WASHOUT WHERE OFFSITE WASHOUT IS NOT POSSIBLE. THIS AREA MUST PROVIDE CONTAINMENT OF WASHOUT MATERIALS AND PREVENT THEM FROM ENTERING INTO THE STORM DRAIN SYSTEM, ESPECIALLY STREAMS, LAKES AND RESERVOIRS.
 - F.3. TRAIN PERSONNEL ABOUT PROPER CONCRETE WASTE MANAGEMENT PROCEDURES.
- G. PAINTS, SOLVENTS AND CLEANERS CAN BE A SOURCE OF POLLUTION.
 - G.1. TRAIN PERSONNEL ON THE PROPER STORAGE AND HANDLING OF THESE MATERIALS. EDUCATE THEM ON PREVENTION AND CLEAN-UP TECHNIQUES. KEEP CONTAINERS CLOSED AND OUT OF THE WAY WHEN NOT IN USE.
 - G.2. ALWAYS USE SECONDARY CONTAINMENT SUCH AS A DROP CLOTH TO CATCH SPILLS AND PREVENT SPREADING.

- G.3. THE LOCATION FOR CLEANING STATIONS SHALL NOT BE NEAR STREAMS, RIVERS, RESERVOIRS, WELLS, OR ADJACENT TO THE STORM WATER COLLECTION SYSTEM. THIS AREA MUST PROVIDE CONTAINMENT OF WASHOUT MATERIALS AND PREVENT THEM FROM ENTERING INTO THE STORM DRAIN SYSTEM. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS WHEN USING ANY PRODUCT.
- G.4. KEEP CLEANUP MATERIALS ON HAND TO ABSORB SPILLS. CLEAN UP SPILLS IMMEDIATELY AND REMEDY CAUSE.
- G.5. EXCAVATE AND DISPOSE OF CONTAMINATED SOILS AS HAZARDOUS WASTE. CONTACT STATE AND LOCAL OFFICIALS FOR ANY SPILL OF REPORTABLE QUANTITY.

- H. EXCESSIVE USE OF LANDSCAPING FERTILIZERS, NUTRIENTS, CHEMICALS AND PESTICIDES CAN LEAD TO UNNECESSARY POLLUTION.
 - H.1. ONLY USE THE REQUIRED OR MINIMUM AMOUNTS OF THESE MATERIALS. ALWAYS FOLLOW MANUFACTURER'S RECOMMENDATIONS.
 - H.2. MINIMIZE IRRIGATION RUNOFF BY NOT OVER WATERING FERTILIZED OR TREATED LANDSCAPE AREAS.

- I. CONSTRUCTION DEBRIS AND OTHER WASTE MATERIALS CAN ENTER THE STORM DRAIN SYSTEM WHEN NOT DISPOSED OF PROPERLY.
 - I.1. PROVIDE ADEQUATE AND CONVENIENT TRASH RECEPTACLES AROUND THE CONSTRUCTION SITE.
 - I.2. KEEP TRASH CONTAINERS COVERED.
 - I.3. EMPTY CONTAINERS IN A TIMELY MANNER TO PREVENT SPILLING OVER.

- J. ON-SITE STORM DRAIN INLETS CAN PERMIT SEDIMENTS TO ENTER OFFSITE STORM DRAIN FACILITIES.
 - J.1. INLETS SHALL BE PROPERLY PROTECTED DURING CONSTRUCTION TO PREVENT BACKFILL MATERIAL FROM ENTERING PIPES AND BOXES.
 - J.2. WHERE ON-SITE COLLECTION BOXES ARE LIKELY TO COLLECT WATER CONTAINING SEDIMENTS, A FILTERING SYSTEM SHALL BE CONSTRUCTED OVER OR AROUND THE INLET GRATE TO TRAP SEDIMENTS AND ALLOW THEM TO SETTLE OUT BEFORE THE WATER ENTERS THE STORM DRAIN SYSTEM.

SECTION 4 – MAINTENANCE, INSPECTIONS & REVISIONS: ALL PREVENTATIVE MEASURES DESIGNED TO ELIMINATE OR MINIMIZE POLLUTION ENTERING THE OFFSITE STORM DRAIN SYSTEM SHALL BE MAINTAINED AND INSPECTED REGULARLY BY THE CONTRACTOR. INSPECTION SHOULD ALSO BE PLANNED BEFORE AND AFTER STORM EVENTS TO VERIFY THAT THESE MEASURES ARE WORKING PROPERLY.

- A. THE CONTRACTOR SHALL KEEP A RECORD OF ALL INSPECTIONS WITH DOCUMENTATION INCLUDING THE DATE, WHICH BEST MANAGEMENT PRACTICES (BMP'S) ARE BEING IMPLEMENTED, HOW EACH BMP IS PERFORMING AND ANY DEFICIENCIES OBSERVED IN THE TYPE OR MAINTENANCE OF THE BMP. INSPECTION BY THE CONTRACTOR SHALL ALSO INCLUDE LABORATORY ANALYSIS RESULTS AS DEEMED NECESSARY BY THE CONTRACTOR OR AS REQUESTED BY THE CITY.

- B. WHEN PREVENTATIVE MEASURES ARE FOUND TO BE INADEQUATE THEY ARE TO BE BROUGHT TO THE ATTENTION OF THE CITY. ALTERATIONS TO THE STORM WATER POLLUTION PREVENTION PLAN MAY BE REQUIRED.

- C. IT IS THE GENERAL CONTRACTORS RESPONSIBILITY TO INSPECT THE ENTIRE SITE AND IDENTIFY ADDITIONAL SOURCES THAT MAY LEAD TO OFFSITE STORM WATER POLLUTION. WHEN A POSSIBLE POLLUTION SOURCE HAS BEEN OVERLOOKED, IT SHALL BE BROUGHT TO THE ATTENTION OF THE CITY. ADDITIONAL PREVENTATIVE MEASURES MAY BE INCORPORATED INTO THE STORM WATER POLLUTION PREVENTION PLAN.

- D. PROVIDE COPIES OF ALL INSPECTION REPORTS AND LABORATORY RESULTS TO THE CITY OR OTHER GOVERNING AGENCIES IMMEDIATELY UPON REQUEST.

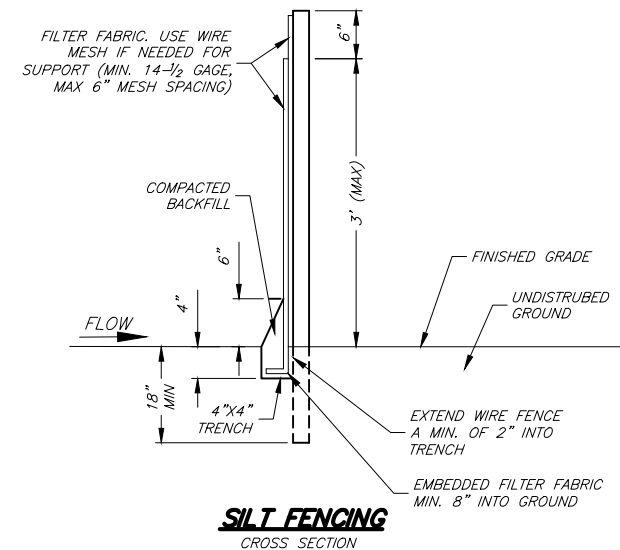
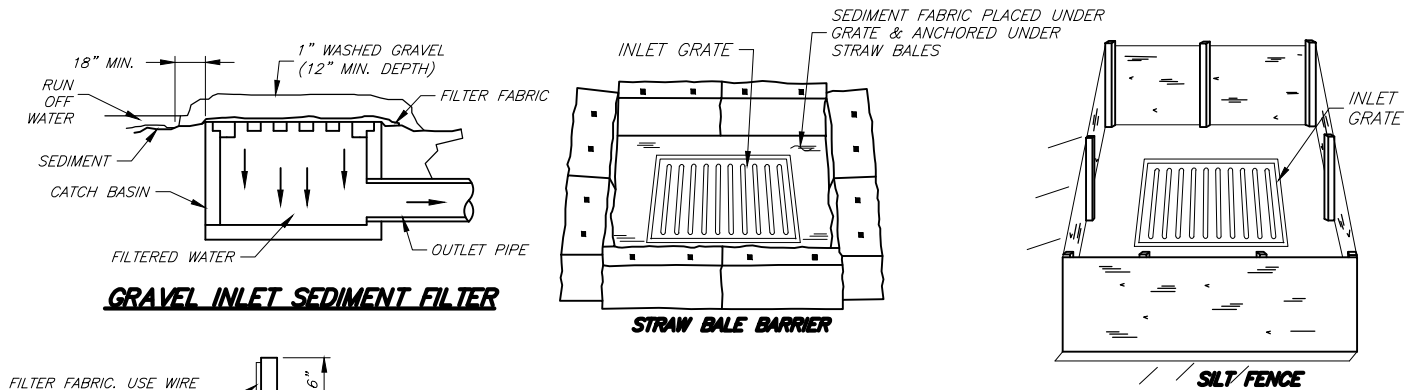
SECTION 5 – POLLUTION INCIDENT REPORTS: ALL REPORTABLE RELEASES OF ANY POLLUTANT SHALL BE DOCUMENTED BY THE CONTRACTOR AND PROMPTLY BROUGHT TO THE ATTENTION OF THE CITY INSPECTOR. REPORTABLE RELEASES ARE DEFINED BY TITLE 40 OF THE CODE OF FEDERAL REGULATIONS (CFR), PART 117, SECTION 3 OR TITLE 40, PART 302, SECTION 4.

SECTION 6 – REPORTABLE VIOLATIONS: IF THERE IS A VIOLATION OF THE STORM WATER POLLUTION PREVENTION PLAN, IT SHALL BE REMEDIED IMMEDIATELY AND BROUGHT TO THE ATTENTION OF THE CITY. ALL VIOLATIONS SHALL BE DOCUMENTED PROPERLY.

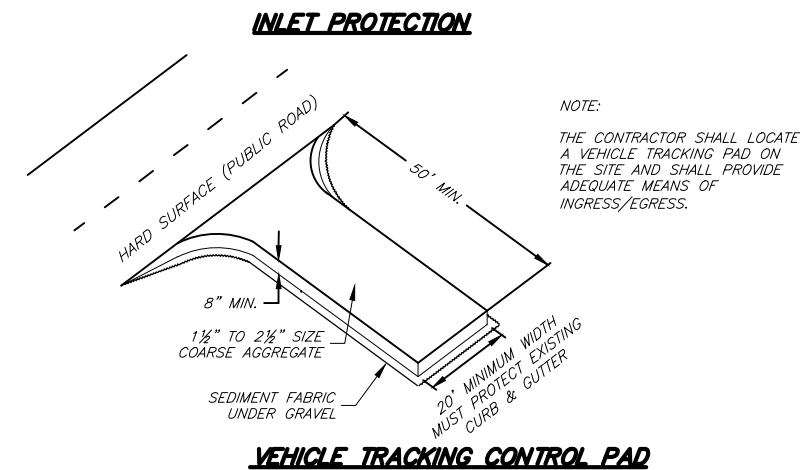
SECTION 7 – TRAINING: IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO TRAIN AND FAMILIARIZE ALL PERSONNEL ON THE CONSTRUCTION SITE WITH RESPECT TO THE STORM WATER POLLUTION PREVENTION PLAN.

SECTION 8 – COMPLIANCE WITH ALL GOVERNING REGULATIONS: ALL DISCHARGES INTO THE STORM WATER SYSTEM MUST COMPLY WITH THE REGULATIONS ESTABLISHED BY CITY, COUNTY, STATE, FEDERAL AND OTHER RELATED AGENCIES.

SECTION 9 – HAZARDOUS WASTE: HAZARDOUS OR TOXIC WASTE SHALL BE DISPOSED OF PROPERLY. REGULATIONS RELATED TO THE PROPER HANDLING AND DISPOSAL OF HAZARDOUS OR TOXIC WASTE ARE NOT COVERED IN THIS PLAN.

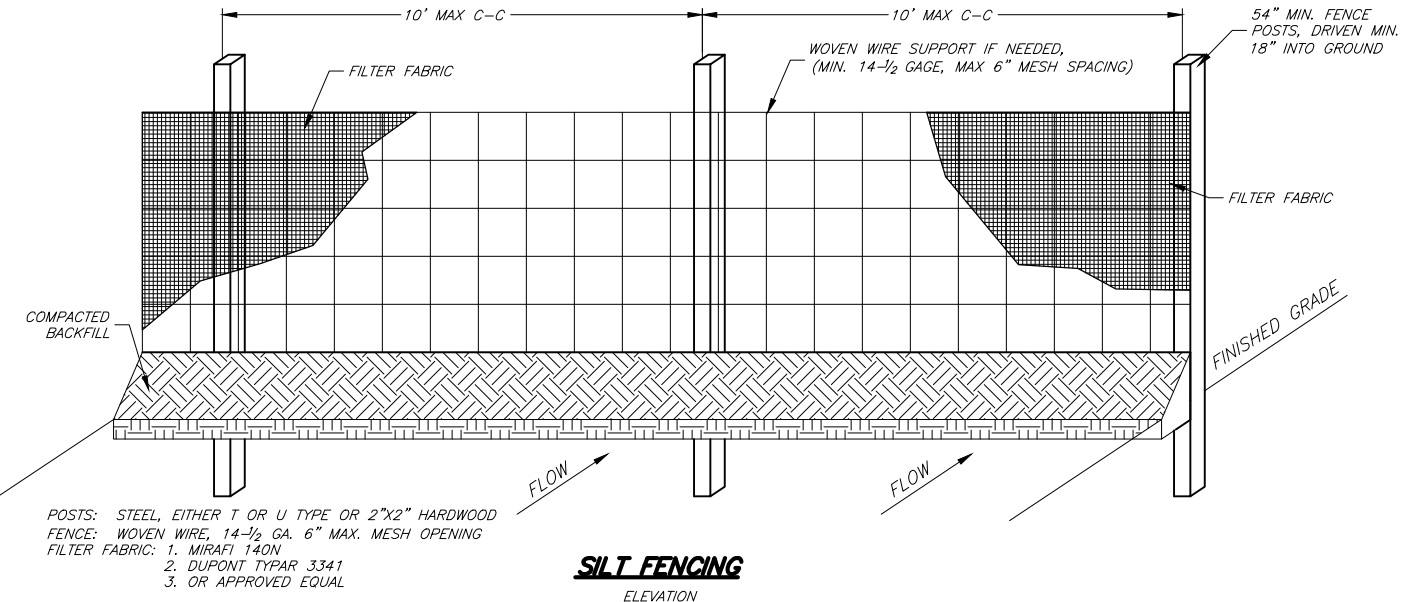


SEE INDIVIDUAL BMP INFORMATION SHEETS FOR INSTRUCTIONS FOR CONSTRUCTION OF STRAW BALE BARRIER & SILT FENCE



SILT FENCING NOTES:

1. USE WOVEN WIRE FENCE IF NEEDED FOR SUPPORT. TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS FOLLOWS:
 - A. THE CONTRACTOR SHALL BE RESPONSIBLE TO INSTALL & MAINTAIN EROSION CONTROL MEASURES NECESSARY TO CONTROL EROSION DURING CONSTRUCTION.
 - B. CONTRACTOR SHALL PROVIDE SILT FENCING AS DIRECTED BY THE OWNER'S REPRESENTATIVE OR AS REQUIRED BY CONSTRUCTION SEQUENCING.
 - C. LOCATIONS OF SILT FENCE ALONG PERIMETER OF SITE SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE OR AS REQUIRED BY CONSTRUCTION SEQUENCING.
 - D. ALL EXPOSED AND UNWORKED SOILS SHALL BE STABILIZED BY SUITABLE AND TIMELY APPLICATION OF EROSION CONTROL MEASURES.
 - E. EROSION/SEDIMENT CONTROL MEASURES SHALL BE IN PLACE PRIOR TO MASS EARTHWORK OPERATIONS.
 - F. COLLECTED MATERIAL SHALL BE REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.



NO.	REVISION	DATE

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
STORM WATER POLLUTION PREVENTION PLAN DETAILS

PROJECT NUMBER 2020-0125
SHEET 28 OF 58
SHEET NUMBER SD-C
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LANDSCAPE STANDARD DRAWINGS - APPROVED MATERIALS

<i>LANDSCAPE</i>		
<i>PART</i>	<i>APPROVED MATERIAL</i>	<i>STANDARD DRAWING</i>
<i>TRAIL - WEED BARRIER</i>	<i>TYPAR #3301</i>	<i>LS-01</i>
<i>ROTOR HEAD SPRINKLER</i>	<i>RAINBIRD FALCON 5000 OR 3500 SERIES</i>	<i>LS-02</i>
<i>POP-UP SPRINKLER</i>	<i>RAINBIRD 1800 SERIES</i>	<i>LS-02</i>
<i>AUTOMATIC CLOCK</i>	<i>RAINBIRD ESP-32MC</i>	<i>LS-02</i>
<i>CONTROL VALVE STATION</i>	<i>RAINBIRD PESB SERIES</i>	<i>LS-02</i>

ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER.

RECORD OF REVISIONS			
NO.	DESCRIPTION	DATE	BY

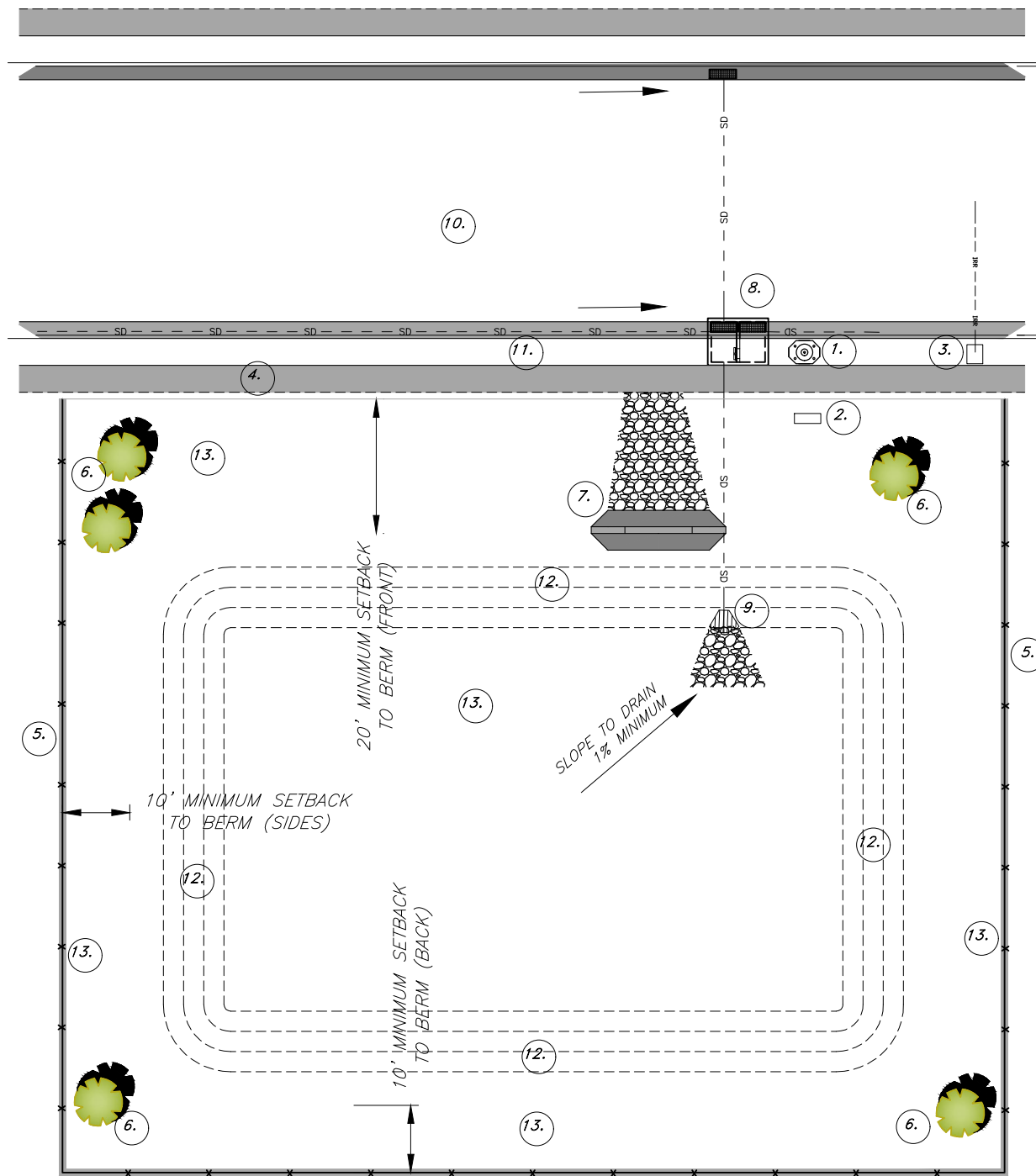
PRINCIPAL
M. CHANDLER
 PROJECT MANAGER
 A. THOMPSON
 CHECKED BY
 A. THOMPSON
 DRAWN BY
 O. CURTIS
 DRAWING SCALE
 N.T.S.
 ISSUE DATE
 9/1/2022

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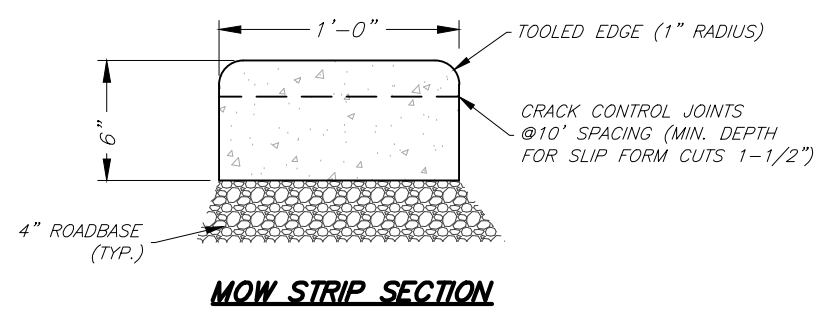
NORTH OGDEN CITY CORPORATION
 PUBLIC WORKS STANDARDS
 LANDSCAPE - APPROVED MATERIALS

PROJECT NUMBER
 2020-0125
 SHEET
 29 OF 58
 SHEET NUMBER
 LS-0

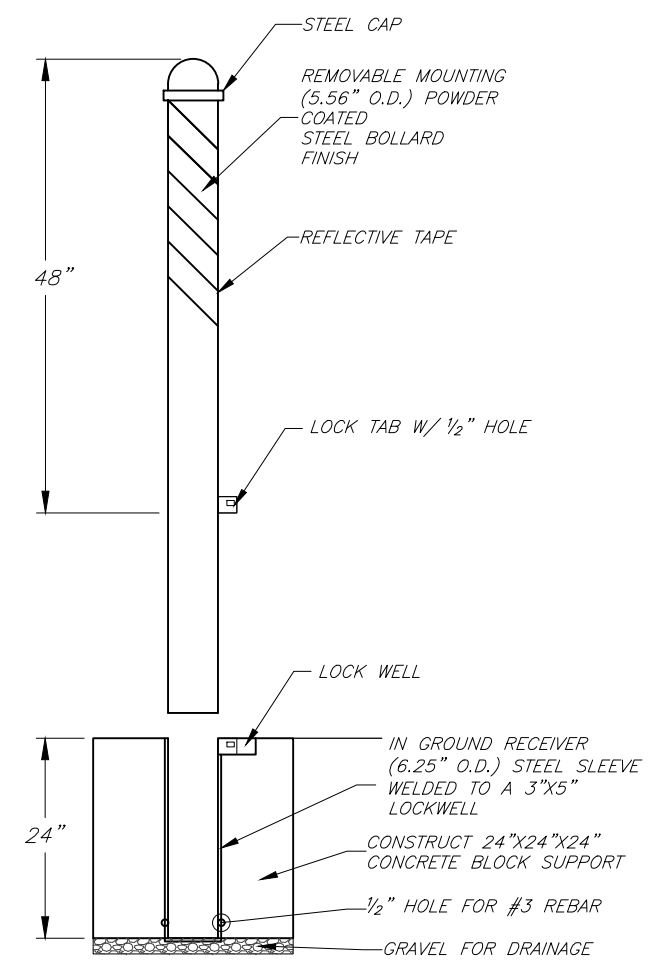


STORM DRAIN BASIN DETAILS

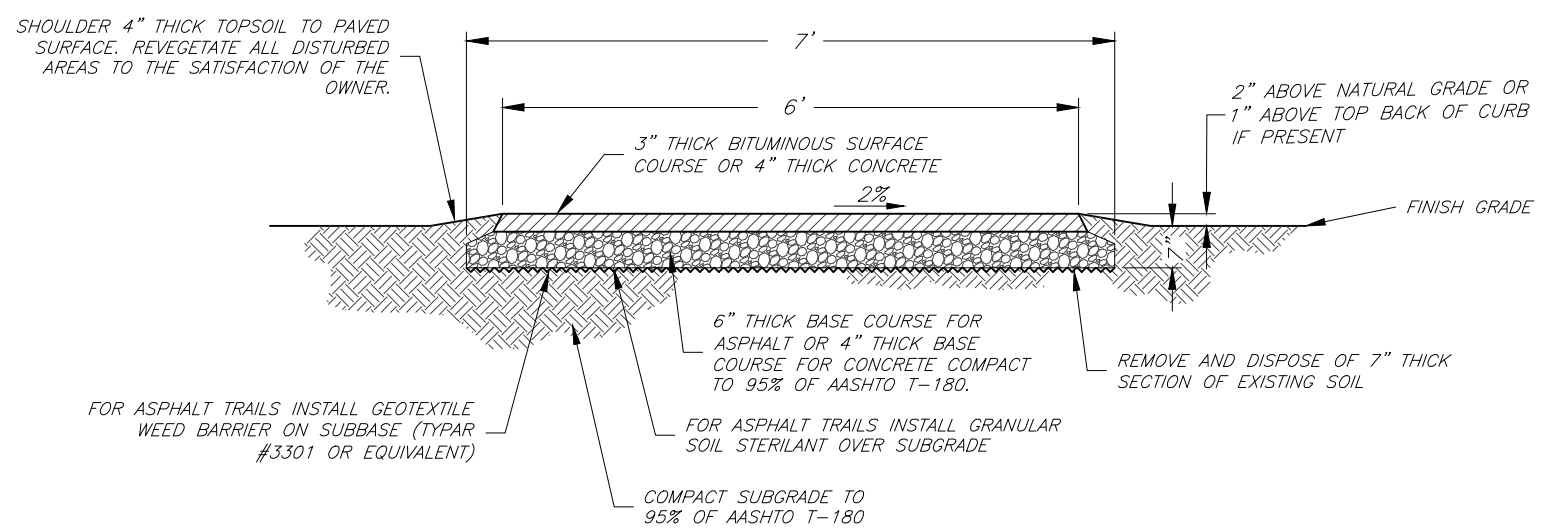
- LEGEND:**
- 1. STREET LIGHT.
 - 2. SPRINKLER TIMER PEDESTAL.
 - 3. IRRIGATION SERVICE LINE.
 - 4. CITY STANDARD CONCRETE SIDEWALK.
 - 5. 6' CHAIN-LINK FENCE W/ CONCRETE MOW STRIP.
 - 6. TREE SELECTION BY PARKS DEPARTMENT (1 EA/2,000 SF)
 - 7. CONCRETE EMERGENCY SPILLWAY WALL W/ RIP-RAP. PROVIDE 1' FREEBOARD.
 - 8. STORM DRAIN CONTROL BOX WITH CANAL GATE & INTERNAL SPILL WALL.
 - 9. FLARED END SECTION WITH GRATE AND RIP-RAP
 - 10. ROADWAY.
 - 11. PARK STRIP WITH LANDSCAPING, OR DECORATIVE ROCK
 - 12. 3:1 SLOPE OR FLATTER (TYPICAL)
 - 13. SOD AND SPRINKLERS, OR COBBLE ROCK



MOW STRIP SECTION



REMOVABLE BOLLARD DETAIL



TRAIL CROSS SECTION

SHOULDER 4" THICK TOPSOIL TO PAVED SURFACE. REVEGETATE ALL DISTURBED AREAS TO THE SATISFACTION OF THE OWNER.

FOR ASPHALT TRAILS INSTALL GEOTEXTILE WEED BARRIER ON SUBBASE (TYPAR #3301 OR EQUIVALENT)

FOR ASPHALT TRAILS INSTALL GRANULAR SOIL STERILANT OVER SUBGRADE

NO.	DESCRIPTION	DATE

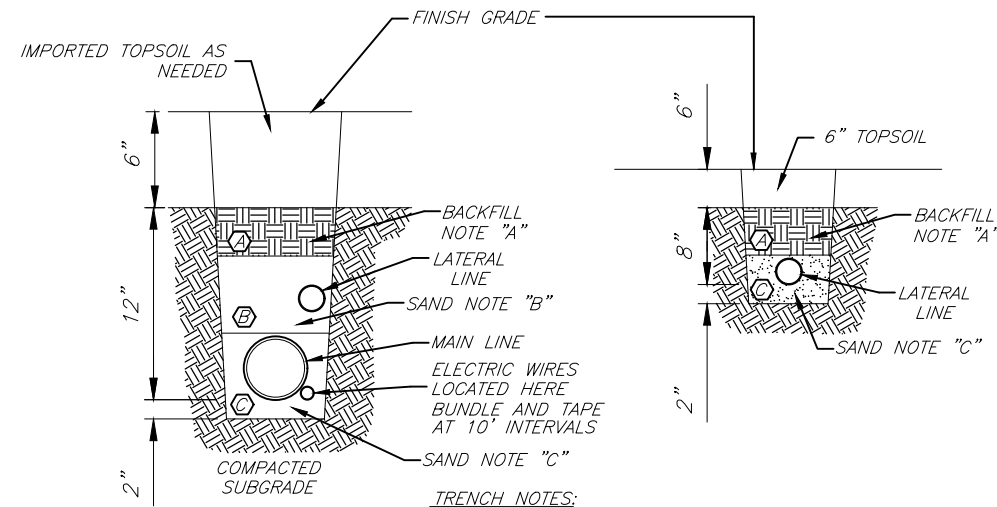
PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
LANDSCAPE (DETENTION BASINS) & ASPHALT/CONCRETE TRAIL DETAILS

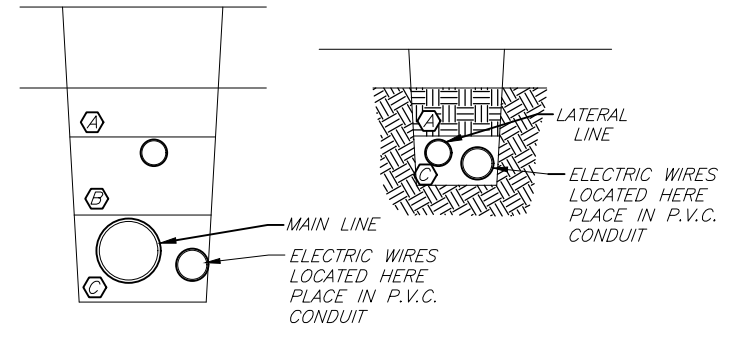
PROJECT NUMBER 2020-0125
SHEET 30 OF 58
SHEET NUMBER LS-0

TRENCH WITH DIRECT BURY WIRE

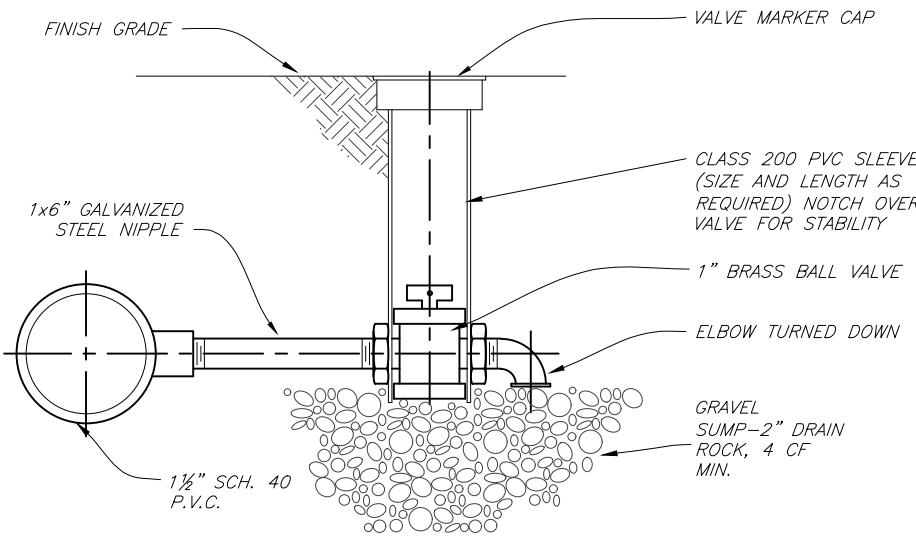
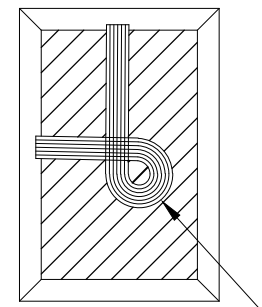


- TRENCH NOTES:**
- (A) USE EXCAVATED TRENCH MATERIAL NOT TO EXCEED 2" DIA. ROCKS.
 - (B) IN CASES WHERE LATERAL LINE IS INSTALLED IN MAINLINE TRENCH, USE SAND TO BACKFILL TRENCH SO THAT LATERAL LINE IS 14" BELOW FINISH GRADE & COVERED W/ SAND.
 - (C) USE SAND TO PROVIDE A 2" BED AND COVER ALL P.V.C. PIPES AND ELECTRICAL WIRES. IN CASES WHEN NATIVE MATERIAL IS NOT ACCEPTABLE AS BACKFILL.
- GEN. NOTE: LOCATE ALL TRENCHES 12" AWAY FROM BUILDINGS, SIDEWALKS, OR ANY HARD SURFACE. SETTLE ALL TRENCHES W/ WATER PRIOR TO FINE GRADING AND RAKING OF TOPSOIL. MAIN LINES RUNNING IN SAME TRENCH SHOULD BE SIDE BY SIDE WITH A MINIMUM DISTANCE OF 6" APART.

TRENCH WITH ELECTRICAL CONDUIT

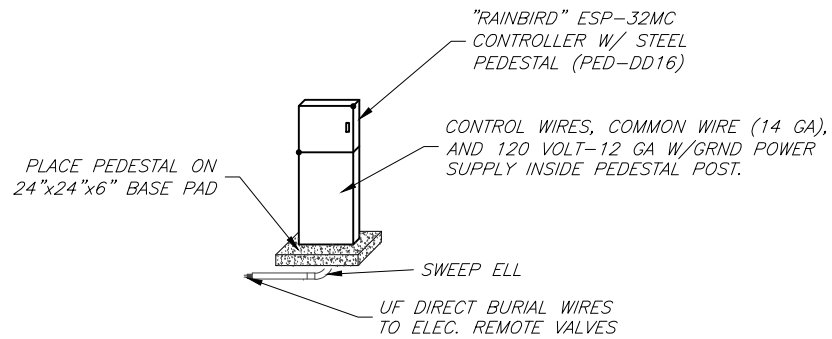


WIRE W/O CONDUIT



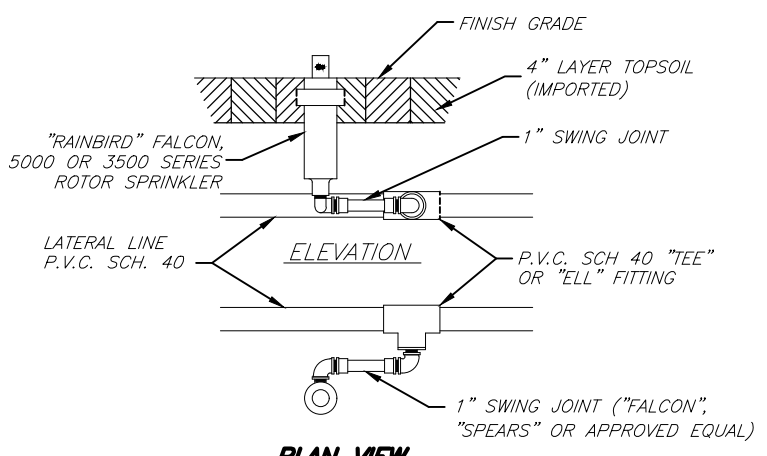
MANUAL DRAIN VALVE

- SPRINKLER NOTES:**
1. INSTALL ALL WIRING ACCORDING TO LOCAL CODES. ALL WIRES ABOVE FINISH GRADE TO BE INSTALLED IN METAL CONDUITS.
 2. SPACE SPRINKLER HEADS AT A MAXIMUM OF 95% OF COVERAGE DISTANCE.

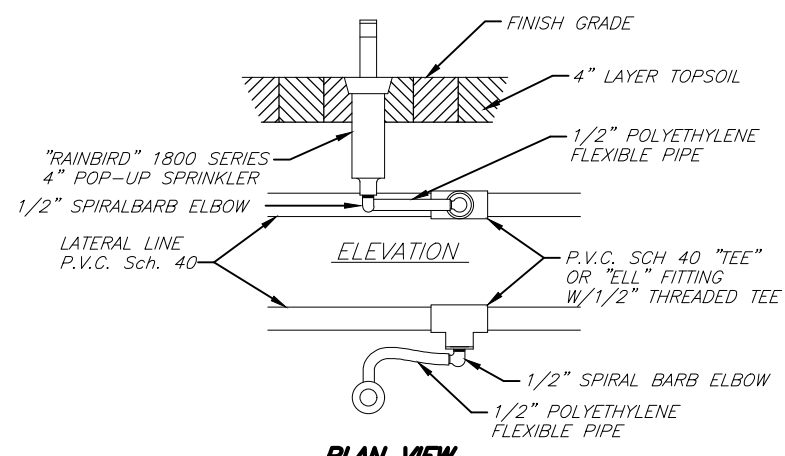


AUTOMATIC CLOCK DETAIL

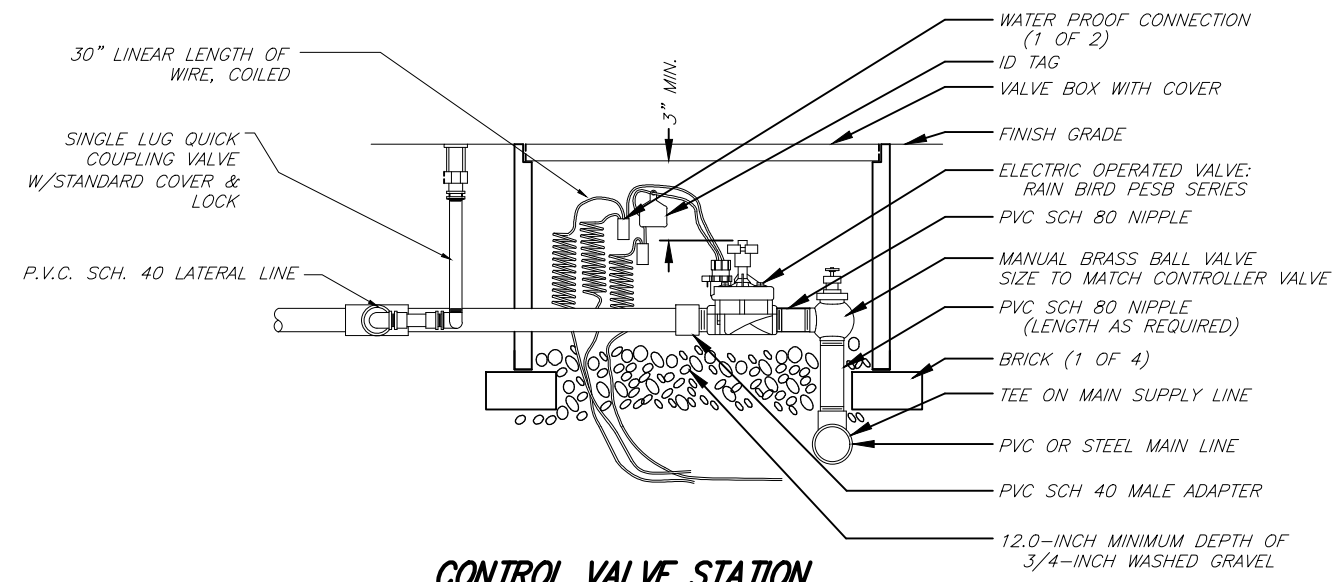
SPRINKLER TRENCH DETAIL



ROTOR HEAD CONNECTION DETAIL



1800 SERIES HEAD CONNECTION DETAIL



CONTROL VALVE STATION

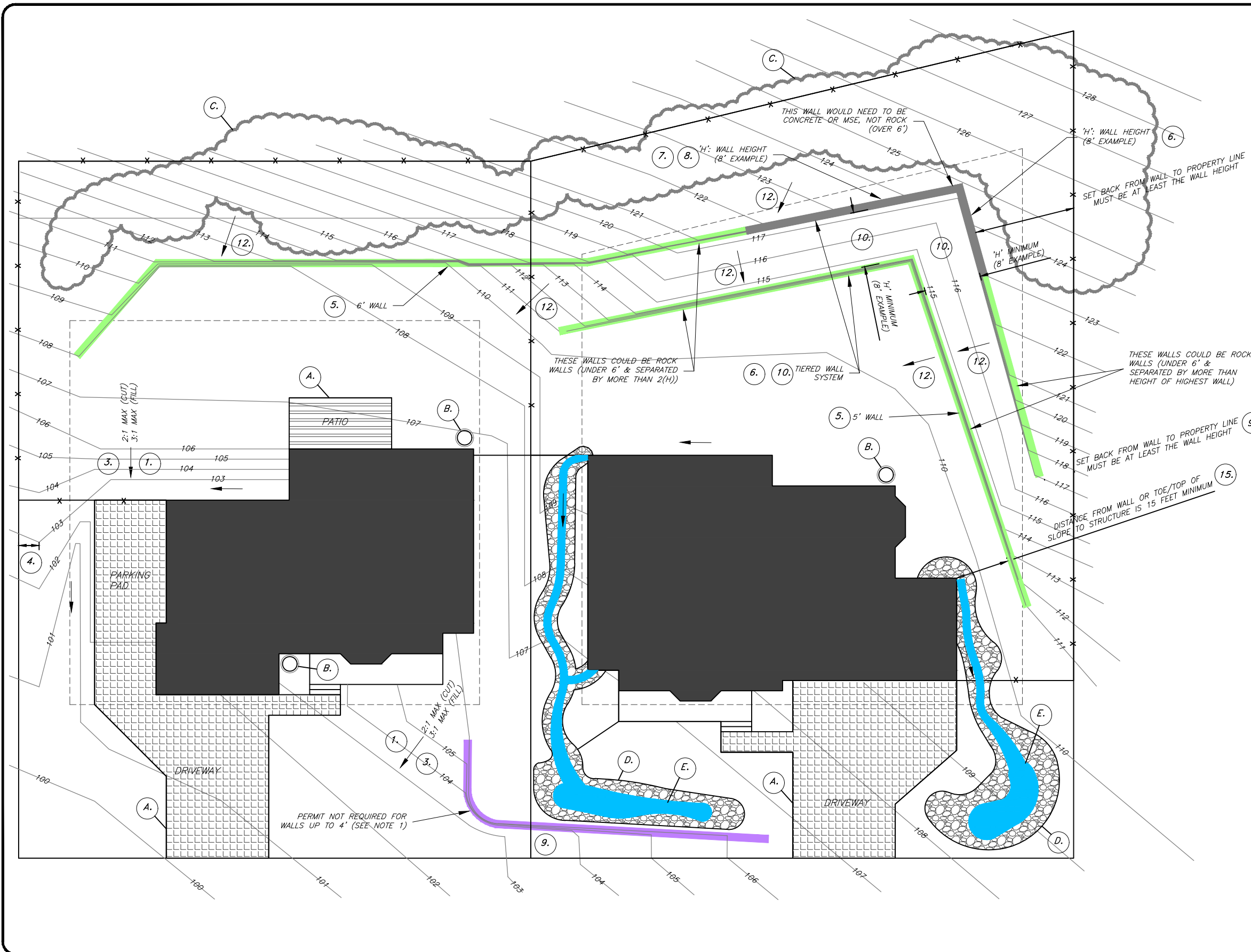
RECORD OF REVISIONS			
7.			

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
IRRIGATION DETAILS

PROJECT NUMBER 2020-0125
SHEET 31 OF 58
SHEET NUMBER LS-0
Page 46



LOW IMPACT DEVELOPMENT NOTES:

LOW IMPACT DEVELOPMENT (LID) BEGINS AT THE PLANNING STAGES. IT REQUIRES THE PRESERVATION, RESTORATION OR CREATION OF GREEN SPACE AND REDUCES THE AMOUNT OF IMPERMEABLE SURFACE TYPICAL TO STANDARD DEVELOPMENT. GREEN SPACE ALSO REDUCES THE AMOUNT OF STORM WATER RUNOFF AND POLLUTANTS THAT MAY REACH WATERWAYS. THESE STANDARDS PROMOTE THE FOLLOWING DEVELOPMENT PLANNING AND DESIGN PRACTICES:

- A. THE USE OF PERVIOUS PAVEMENT FOR DRIVEWAYS, PATIOS AND OFF-STREET PARKING IS ENCOURAGED TO REDUCE STORM WATER RUNOFF (IE. PAVERS, PERVIOUS CONCRETE, PERVIOUS ASPHALT).
- B. STORM WATER STORED IN RAIN BARRELS IS ALSO ENCOURAGED AROUND RESIDENTIAL STRUCTURES. RAIN BARRELS ARE TO BE EMPTIED BETWEEN STORMS. THIS IS KNOWN AS HARVEST AND REUSE.
- C. PRESERVATION OF NATIVE VEGETATION IS ENCOURAGED TO REDUCE SOIL DISTURBANCE AND EROSION. MATURE TREES, SHRUBS AND OTHER PLANTS WILL HOLD SOIL IN PLACE AND UTILIZE RAIN WATER THROUGH INTERCEPTION AND TRANSPIRATION.
- D. EXPANDED LANDSCAPING BY THE CREATION OF GREEN SPACE REDUCES STORM WATER RUNOFF AND PROVIDES A LOCATION FOR TREATMENT OF STORM WATER THROUGH BIOLOGICAL PROCESSES. XERISCAPE LANDSCAPING ALLOWS THE EXPANSION OF LANDSCAPING WHILE CONSERVING IRRIGATION WATER AND ALLOWS SOIL TO ABSORB MORE STORM WATER RUNOFF.
- E. LANDSCAPE DEPRESSIONS ALSO KNOWN AS RAIN GARDENS ARE ALSO ENCOURAGED TO GATHER AND RETAIN STORM WATER UNTIL IT PERCOLATES INTO THE SOIL.

IMPACTS FROM STORM WATER POLLUTION CAN BE MITIGATED USING THE FOLLOWING LOW IMPACT DESIGN OPTIONS IN THE PUBLIC RIGHT-OF-WAY:

- F. NARROWER PAVEMENT WIDTHS REDUCE STORM WATER RUNOFF.
- G. THE ELIMINATION OF ROADSIDE GUTTER COMBINED WITH BIOSWALES TO CAPTURE AND FILTER RUNOFF FROM STREETS.
- H. THE USE OF BIODIRECTION CELLS TO CAPTURE AND TREAT POLLUTANTS.
- I. THE USE OF TREE BOX FILTERS TO CAPTURE AND TREAT POLLUTANTS.
- J. THE USE OF INFILTRATION GALLERIES WITH APPROPRIATE PRETREATMENT TO REPLENISH UNDERGROUND AQUIFERS.

IT IS IMPORTANT TO REDUCE THE AMOUNT OF STORM WATER RUNOFF AND TO TREAT POLLUTANTS THAT ARE CARRIED INTO RECEIVING WATER BODIES BY STORM WATER RUNOFF. THE USE OF BIOSWALES, BIODIRECTION CELLS, AND TREE BOX FILTERS ARE ENCOURAGED FOR THEIR ABILITY TO TREAT STORM WATER. CORRESPONDING DETAILS ARE FOUND IN THESE PUBLIC WORKS STANDARDS.

GRADING AND RETAINING WALL NOTES:

CONSTRUCTION ACTIVITIES AND PRACTICES CAN HAVE A NEGATIVE IMPACT ON STORM WATER AND THE ENVIRONMENT. PROPER GRADING PRACTICES CAN HELP REDUCE SOME OF THE NEGATIVE ENVIRONMENTAL AND VISUAL IMPACTS FROM DEVELOPMENT. THESE STANDARDS INCLUDE THE FOLLOWING PRACTICES:

1. PERMANENT CUT SLOPES STEEPER THAN 2(H) TO 1(V) OR FILL SLOPES STEEPER THAN 3(H) TO 1(V) WILL REQUIRE A RETAINING WALL UNLESS OTHERWISE RECOMMENDED BY AN ENGINEERING ANALYSIS.
2. ALL SLOPES 3:1 OR STEEPER WILL REQUIRE AN EROSION PROTECTION PLAN.
3. PERMANENT CUT OR FILL SLOPES AT OR NEAR THE NATURAL ANGLE OF REPOSE OF THE SOIL CANNOT EXCEED A VERTICAL HEIGHT OF 6 FEET UNLESS OTHERWISE RECOMMENDED BY AN ENGINEERING ANALYSIS.
4. THE TOP OR TOE OF A CUT OR FILL MUST BE SET BACK AT LEAST 4 FEET FROM PROPERTY LINE.
5. A BUILDING PERMIT IS NEEDED TO CONSTRUCT A RETAINING WALL THAT IS OVER 4 FEET IN HEIGHT MEASURED FROM THE BOTTOM OF THE FOOTING TO THE TOP OF THE WALL. THE BUILDING OFFICIAL MAY REQUIRE A PERMIT ON SHORTER WALLS IF INSTABILITY IS SUSPECTED.
6. ENGINEERING IS REQUIRED ON ALL WALLS OVER 6 FEET IN HEIGHT.
7. GRAVITY WALLS OVER 6 FEET IN HEIGHT ARE NOT PERMITTED.
8. WALLS OVER 8 FEET IN HEIGHT ARE NOT PERMITTED AND MUST BE TERRACED.
9. WALLS MUST BE SET BACK FROM PROPERTY LINES A DISTANCE EQUAL TO THEIR HEIGHT AS A SAFETY BUFFER TO ADJACENT PROPERTY AND TO PRESERVE THE VIEW FROM ADJACENT DWELLINGS.
10. WALLS THAT ARE TERRACED MUST BE SEPARATED FROM EACH OTHER BY A DISTANCE OF AT LEAST THEIR HEIGHT AND INCLUDE A GLOBAL STABILITY ANALYSIS. WALLS SEPARATED BY A DISTANCE OF MORE THAN TWO TIMES THEIR HEIGHT WILL NOT BE CONSIDERED TERRACED WALLS. RATHER, THEY MAY BE CONSIDERED AS SEPARATE WALLS.
11. FENCING THAT DOES NOT RETAIN EARTH IS NOT CONSIDERED PART OF A RETAINING WALL OR RETAINING WALL SYSTEM.
12. THE SLOPE ABOVE OR BELOW A RETAINING WALL MAY NOT EXCEED 4(H) TO 1(V) UNLESS IT IS OTHERWISE DESIGNED AND STAMPED BY AN ENGINEER LICENSED IN THE STATE.
13. ROCK OR OTHER COVERINGS ON A STEEPENED SLOPE (ROCKERY) MAY BE CONSIDERED A RETAINING WALL WHEN THE SLOPE EXCEEDS THE MAXIMUM PERMANENT CUT OR FILL SLOPE RECOMMENDED BY A GEOTECHNICAL ANALYSIS. IF A SLOPE REQUIRES A ROCKERY TO BE STABLE THEN IT IS TO BE TREATED AS A RETAINING WALL.
14. IF THESE REQUIREMENTS ARE MORE RESTRICTIVE THAN THE STANDARDS FOUND ELSEWHERE IN THE ORDINANCE THEN THESE STANDARDS WILL APPLY.
15. A STRUCTURE CANNOT BE LOCATED WITHIN 15 FEET OF THE TOE OR TOP OF A SLOPE THAT IS STEEPER THAN 2(H) TO 1(V). A STRUCTURE CANNOT BE LOCATED WITHIN 15 FEET OF THE BASE OR TOP OF A RETAINING WALL.

NO.	DATE	DESCRIPTION

PRINCIPAL M. CHANDLER PROJECT MANAGER A. THOMPSON CHECKED BY A. THOMPSON DRAWN BY O. CURTIS DRAWING SCALE N.T.S. ISSUE DATE 8/31/2022
--

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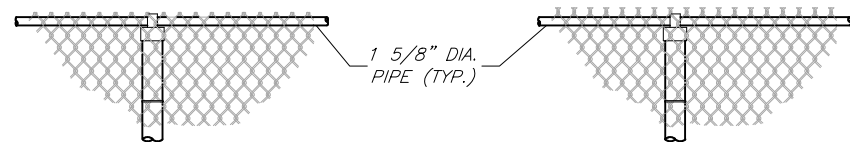
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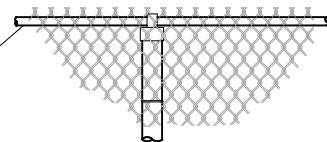
NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
L.I.D. NOTES, GRADING AND RETAINING WALLS

PROJECT NUMBER 2020-0125	
SHEET 32	OF 58
SHEET NUMBER LS-0	

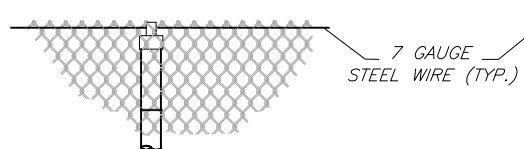
Page 47



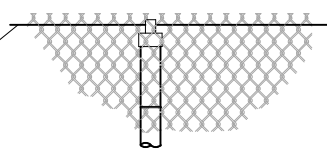
KNUCKLED SELVAGE TYPE I



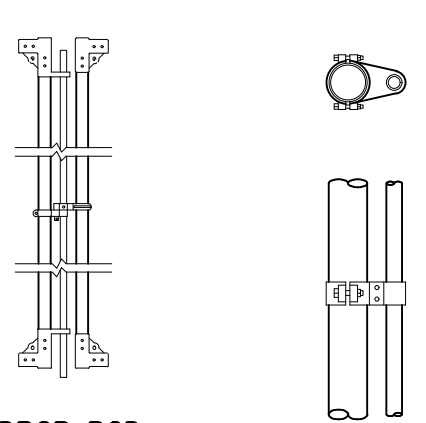
TWISTED & BARBED SELVAGE TYPE II



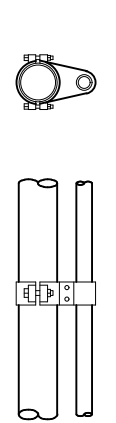
KNUCKLED SELVAGE W/ TENSION WIRE TYPE III



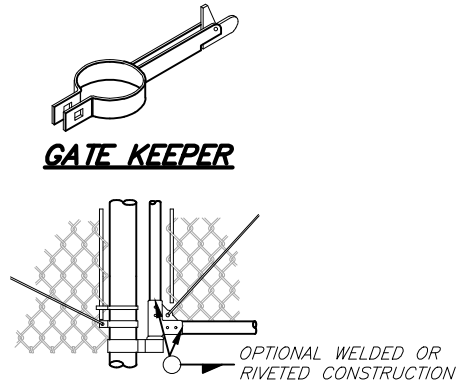
TWISTED & BARBED SELVAGE W/ TENSION WIRE TYPE IV



DROP ROD ASSEMBLY

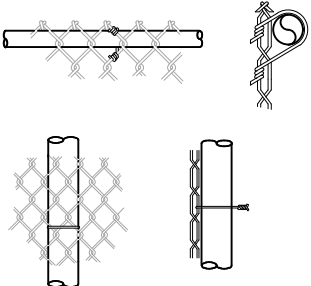


TOP GATE HINGE

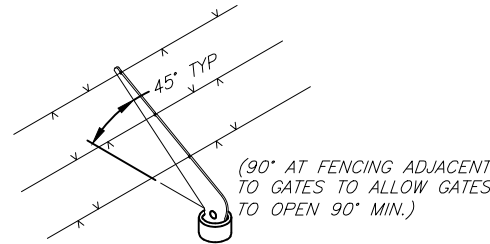


GATE KEEPER

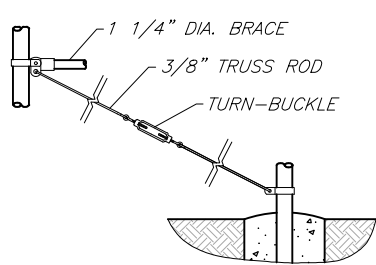
BOTTOM GATE HINGE AND GATE DETAIL



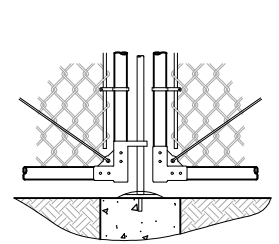
PIPE POST TIE



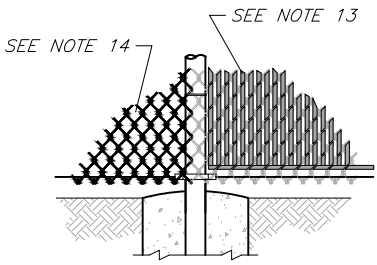
COMBINATION CAP AND BARBED WIRE SUPPORTING ARM



BRACE & TRUSS CONNECTIONS



CENTER GATE STOP AND GATE DETAIL



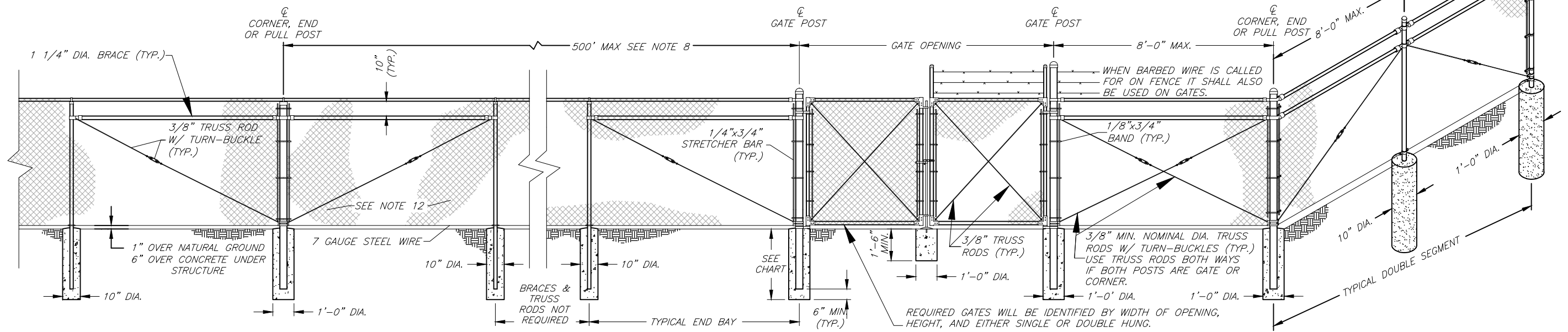
SLATS & VINYL COATING DETAIL

- NOTES:
- MATERIALS, CONSTRUCTION, AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PROJECT STANDARD SPECIFICATIONS.
 - THE TYPE OF TOP SUPPORT IS SPECIFIED IN THE BIDDING SCHEDULE, TYPES I AND II TUBULAR RAIL, TYPES III AND IV TENSION WIRE.
 - BARB WIRE SHALL BE USED ONLY WHEN DESIGNATED ON THE PLANS OR IN THE SPECIFICATIONS.
 - TWISTED AND BARBED SELVAGE TOP AND BOTTOM SHALL BE USED ON FENCES 5- FEET HIGH OR GREATER.
 - KNUCKLED SELVAGE ON TOP AND TWISTED AND BARBED ON BOTTOM SHALL BE USED ON FENCES LESS THAN 5- FEET.
 - ALL STEEL PIPE MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A 120 SCHEDULE 40 HOT DIPPED ZINC COATED HIGH TENSILE STEEL PIPE OR TRIPLE COATED PIPE MADE FROM STEEL CONFORMING TO ASTM 569.
 - POSTS SHALL BE STEEL SCHEDULE 40 PIPE OR TRIPLE COATED HIGH TENSILE STEEL PIPE OF THE SIZE SHOWN IN THE CHART. WEIGHT IN POUNDS PER FOOT WITH A TOLERANCE OF 5%.
 - LINE POSTS SHALL BE LOCATED AT EQUAL SPACING FOR EACH SEGMENT WITH A MAXIMUM SPACING AS FOLLOWS:
 - TANGENT SECTIONS TO 500-FOOT RADIUS NOT MORE THAN 8- FEET.
 - UNDER 500-FOOT RADIUS TO 200-FOOT RADIUS NOT MORE THAN 8- FEET.
 - UNDER 200-FOOT RADIUS TO 100-FOOT RADIUS NOT MORE THAN 6- FEET.
 - UNDER 100-FOOT RADIUS NOT MORE THAN 5- FEET.
 - TRUSS RODS AND BRACES SHALL NOT BE REQUIRED FOR FABRIC HEIGHT LESS THAN 5- FEET.
 - TENSION WIRE SHALL BE 7 GAUGE ZINC- OR ALUMINUM- COATED COIL SPRING STEEL TENSION WIRE.
 - ALL POSTS SHALL BE SET IN CONCRETE AND SHALL BE TOPPED WITH BALL TYPE OR OTHER APPROVED ORNAMENT.
 - ALL FABRIC SHALL BE 2" GALVANIZED 9 GAUGE MESH.
 - WHITE VERTICAL SEMI-PRIVACY VINYL SLATS WITH BOTTING-LOCKING SLAT, WHEN REQUIRED BY THE CITY. OTHER COLORS AS APPROVED BY THE CITY.
 - BLACK VINYL COATED CHAINLINK FENCING WHEN REQUIRED BY THE CITY.
 - TOP RAILS SHALL BE 1 1/8" DIA 17G GALVANIZED

**VINYL FENCE OR OTHER FENCE STYLES MAY BE USED WITH WRITTEN APPROVAL BY THE CITY. SUBMIT CONSTRUCTION PLANS AND FENCING DETAILS TO CITY FOR REVIEW AND ACCEPTANCE PRIOR TO CONSTRUCTION.

HEIGHT	GATE OPENING	GATE POST	GATE FRAME
UNDER 6 FEET	SINGLE TO 6' OR DOUBLE TO 12'	2"	1"
	SINGLE OVER 6' TO 8' OR DOUBLE OVER 12' TO 16'	2 1/2"	1 1/2"
	SINGLE OVER 8' TO 12' OR DOUBLE 16' TO 24'	4"	1 1/2"
6 FEET AND OVER	SINGLE TO 6' OR DOUBLE TO 12'	3 1/2"	1 1/2"
	SINGLE OVER 6' TO 12' OR DOUBLE OVER 12' TO 24'	4"	1 1/2"
	SINGLE OVER 12' TO 18' OR DOUBLE OVER 24' TO 36'	6"	1 1/2"
	SINGLE OVER 18' OR DOUBLE OVER 36'	8"	1 1/2"

HEIGHT OF FABRIC	DEPTH OF POSTS	LENGTH OF END, CORNER OR PULL POST	LENGTH OF LINE POST HOLES	SIZE OF POSTS							
				END, CORNER, & PULL POSTS				LINE POST MIN. SIZE			
				NOM. SIZE	OUTSIDE DIA.	PIPE WEIGHT ASTM A-120 TRIPLE COATED	NOM. SIZE	OUTSIDE DIA.	PIPE WEIGHT ASTM A-120 TRIPLE COATED		
7'	3'	10'	9'-8"	2 1/2"	2.875"	5.79	4.64	2"	2.375"	3.65	3.11
6'	3'	9'	8'-8"	2 1/2"	2.875"	5.79	4.64	2"	2.375"	3.65	3.11
5'	3'	8'	7'-8"	2"	2.375"	3.65	3.11	1 1/2"	1.900"	2.72	2.23
4'	3'	6'	5'-8"	2"	2.375"	3.65	3.11	1 1/2"	1.900"	2.72	2.23
3'	3'	5'	4'-8"	2"	2.375"	3.65	3.11	1 1/2"	1.900"	2.72	2.23



NO.	DESCRIPTION	DATE

PROJECT MANAGER A. THOMPSON	PROJECT MANAGER M. CHANDLER
CHECKED BY A. THOMPSON	CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS	DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.	DRAWING SCALE N.T.S.
ISSUE DATE 5/16/2022	ISSUE DATE 5/16/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
CHAIN LINK FENCE STANDARDS

PROJECT NUMBER 2020-0125	SHEET 28	OF 51
SHEET NUMBER FC-51		

LIGHTING STANDARD DRAWINGS - APPROVED MATERIALS

<i>LIGHTING</i>		
<i>PART</i>	<i>APPROVED MATERIAL</i>	<i>STANDARD DRAWING</i>
<i>LIGHT POLE</i>	<i>Hubbell RTS#07P, Valmont DS#7.5A286-6S</i>	<i>LT-01</i>

ALL SPECIFIED BRANDS OF MATERIALS SHOWN ON THESE DRAWINGS ARE "CITY STANDARDS." OTHER EQUIVALENT BRANDS MAY BE USED WITH THE PRIOR APPROVAL OF THE CITY ENGINEER.

RECORD OF REVISIONS			
NO.	DATE	DESCRIPTION	BY

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	9/1/2022

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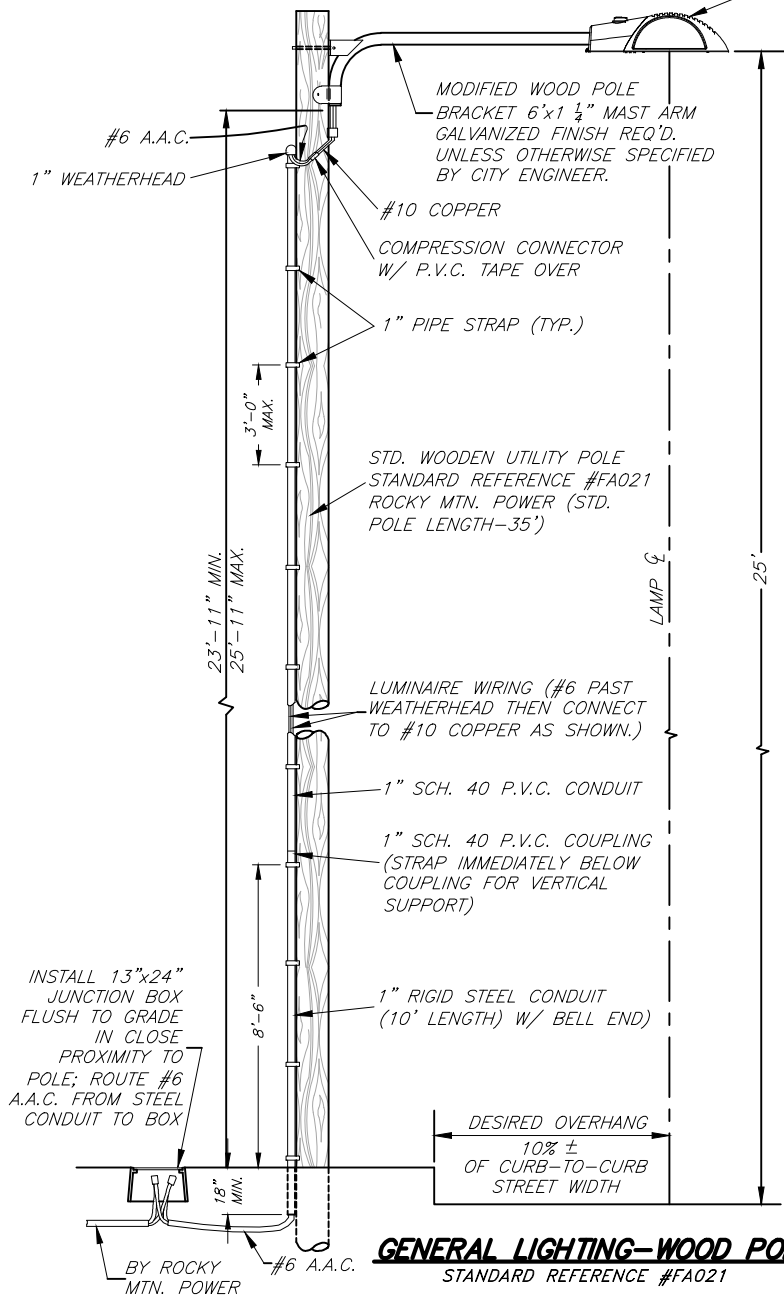
NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
STREET LIGHTING STANDARDS - APPROVED MATERIALS

PROJECT NUMBER	2020-0125	
SHEET	34	OF
SHEET NUMBER	58	
SHEET NAME	LT-0	

- * STREET LIGHTS MUST BE LOCATED AT ALL INTERSECTIONS, CORNERS, AND CUL-DE-SACS FOR ALL STREET TYPES AT LOCATIONS SHOWN ON APPROVED CONSTRUCTION PLANS.
- ** STREET LIGHTS MUST BE SPACED AT THE MAXIMUM SPACING REQUIREMENTS AS SPECIFIED BY MANUFACTURER AND SHOULD ALTERNATE EACH SIDE OF THE STREET AT LOCATIONS SHOWN ON APPROVED CONSTRUCTION PLANS.

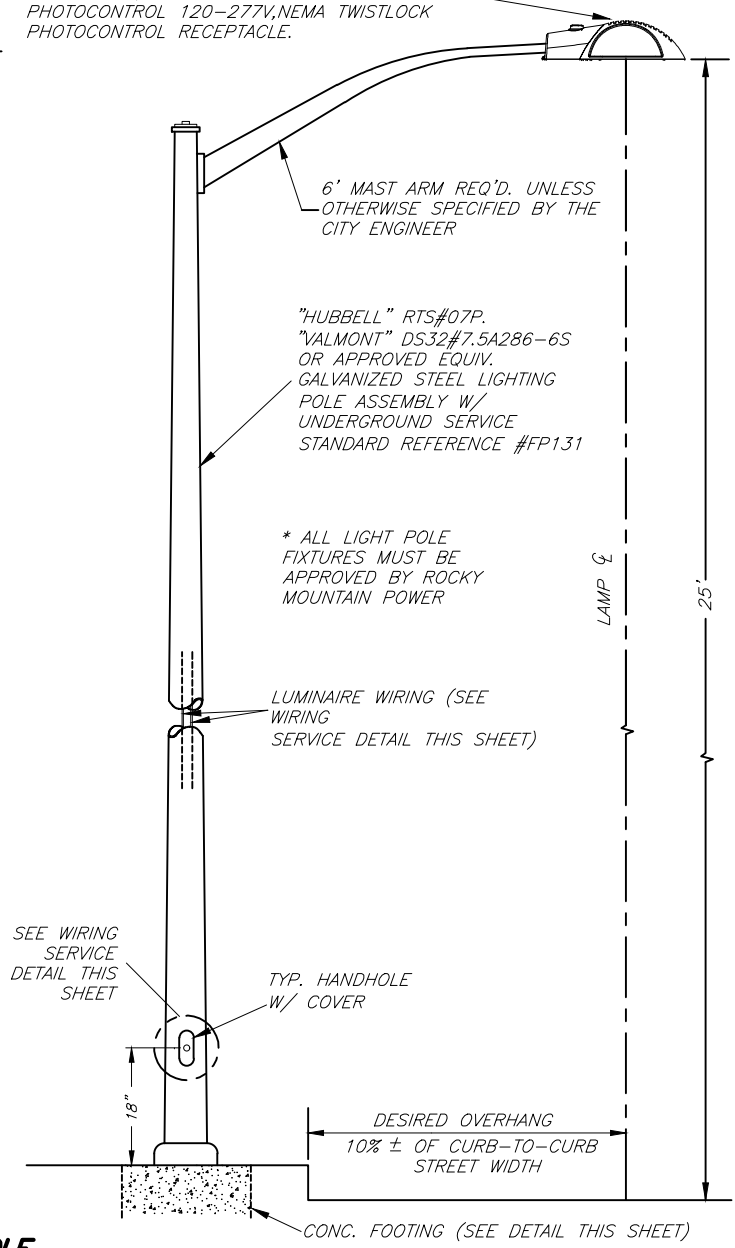
ATTENTION DEVELOPER/CONTRACTOR SHALL NOTIFY THE ROCKY MOUNTAIN POWER OFFICE PRIOR TO LIGHTING INSTALLATION TO ARRANGE FOR POWER TO BE PROVIDED ON SITE, AS WELL AS APPROVAL OF LIGHTING UNIT LOCATIONS AND APPROVAL OF ACTUAL COMPONENT SELECTION. REFER TO THE ROCKY MOUNTAIN POWER DISTRIBUTION CONSTRUCTION STANDARD MANUAL FOR IDENTIFICATION OF ALL STANDARD REFERENCE NUMBERS LISTED ON THIS SHEET. ALL FINAL WORK AND MATERIAL TO BE APPROVED BY THE CITY AND THE CITY ENGINEER.

LEDG 120 53 5K AS G L3 PCS R
LEGEND ROADWAY LED, EQUIVALENT TO 150W
HPS, 525MA DRIVER, 5,000 K CCT, AUTO-SENSING
VOLTAGE, 120 THRU 277, GRAY, TYPE III, WIDE
ASYMMETRIC, DTL SOLID-STATE LIGHTING
PHOTOCONTROL 120-277V, NEMA TWISTLOCK
PHOTOCONTROL RECEPTACLE.



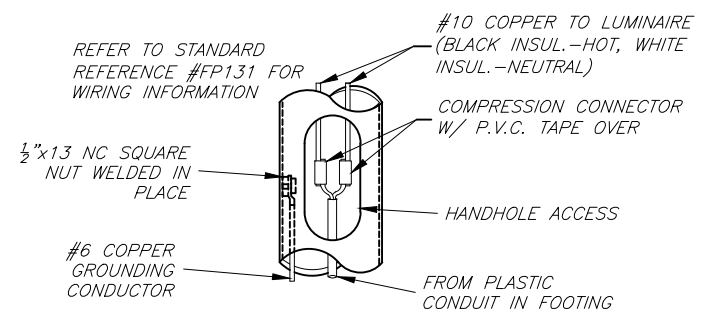
GENERAL LIGHTING-WOOD POLE
STANDARD REFERENCE #FA021

- WOOD POLE NOTES:**
- STANDARD MAST LENGTH FOR WOODEN UTILITY POLES SHALL BE 6'x1 1/4" UNLESS OTHERWISE SPECIFIED BY THE CITY ENGINEER. TYPE OF MAST ARM IS DEPENDENT ON LENGTH AND MAY VARY IF SIZE TO BE USED IS CHANGED. FOR VARIOUS SIZES, TYPES AND THEIR MOUNTING HEIGHTS CONSULT STANDARD REFERENCE #021, TABLES 1, 2 AND 3.
 - MAXIMUM HEIGHT MAY BE EXCEEDED ON EXISTING POLES, BUT ONLY IF SPACE ON SUCH POLES IS AVAILABLE AND UNUSED.
 - DUE TO HIGH GLARE CAUSED BY LED LUMINAIRE, IT IS ESSENTIAL THAT LUMINAIRE ARE NOT MOUNTED AT ANY HEIGHT LOWER THAN THE MINIMUM SPECIFIED.
 - BURY POLE 10% OF TOTAL LENGTH + 24"(5'-6" FOR 35' POLE), BURY POWER RISER MIN. 18".

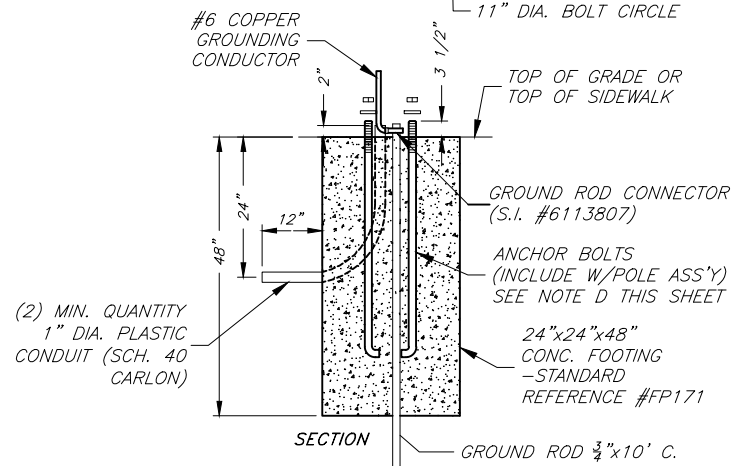
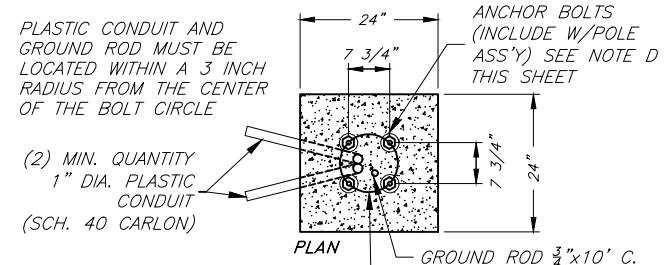


GENERAL LIGHTING-STEEL POLE
STANDARD REFERENCE #FA131

- STEEL POLE NOTES:**
- ALL STEEL POLES MUST HAVE PROVISIONS FOR GROUNDING AND MUST BE EFFECTIVELY GROUNDED AFTER INSTALLATION. A 1/2 INCH x 13 NC SQUARE NUT SHALL BE WELDED BE INSIDE THE POLE BY THE MANUFACTURER FOR GROUNDING CONNECTION.
 - SPECIFY "HUBBELL" RTS#08P OR "VALMONT" DS32#7.5A286-6S OR APPROVED EQUIV. FOR 6' MAST ARM IF REQ'D.
 - POLES SHALL BE HOT DIP GALVANIZED UNLESS OTHERWISE SPECIFIED.
 - CATALOG NUMBERS INCLUDE HOT DIP GALVANIZED ANCHOR BOLTS AND BASE COVERS.
 - POLE SIZE IS ADEQUATE FOR SINGLE OR TWIN BRACKET APPLICATION. SPECIFY "HUBBELL" RTS#22P OR "VALMONT" DS32#7.5A286-6D FOR 6' TWIN ARM, SPECIFY "HUBBELL" RTS#23P OR "VALMONT" DS32#7.5A286-8D FOR 8' TWIN ARM.
 - MAST ARMS FOR METAL POLES ARE WITH TENON FOR 2 INCH LUMINAIRE SLIP-FITTER.



WIRING SERVICE DETAIL



TYPICAL CONCRETE FOOTING
STANDARD REFERENCE #FP171

THE FOOTING AS SPECIFIED ON THIS STANDARD IS DESIGNED FOR USE WITH THE STD. 11 GA. (OR 10 GA.) METAL STREET LIGHT POLES FOR MOUNTING HEIGHTS UP TO 32 FEET. IT SHOULD NOT BE APPLIED IN LOCATIONS WHICH REQUIRE A POLE OF HIGHER STRENGTH (SUCH AS A DEAD-END POLE, COMBINATION STREET LIGHT/TRAFFIC SIGNAL POLE, OR ETC.)

- FOOTING NOTES:**
- FOOTINGS WILL GENERALLY BE INSTALLED BY A CONTRACTOR. FOOTINGS SHOULD BE LOCATED WITH THE VERTICAL C 24" + BACK FROM THE EDGE OF CURB.
 - THE MANUFACTURER SHALL FURNISH (4) ANCHOR BOLTS, (1) GROUND ROD & PLASTIC CONDUITS FOR EACH FOOTING AS REQ'D.
 - NUMBER AND ORIENTATION OF THE PLASTIC CONDUITS ARE INFLUENCED BY THE UNDERGROUND CIRCUIT ROUTE AND SHOULD BE DETERMINED IN EACH LOCATION FOR THE MOST PRACTICAL SOLUTION.
 - ANCHOR BOLTS SHALL BE FURNISHED WITH 6" MIN. THREAD LENGTH AND SHALL BE HOT DIP GALV.

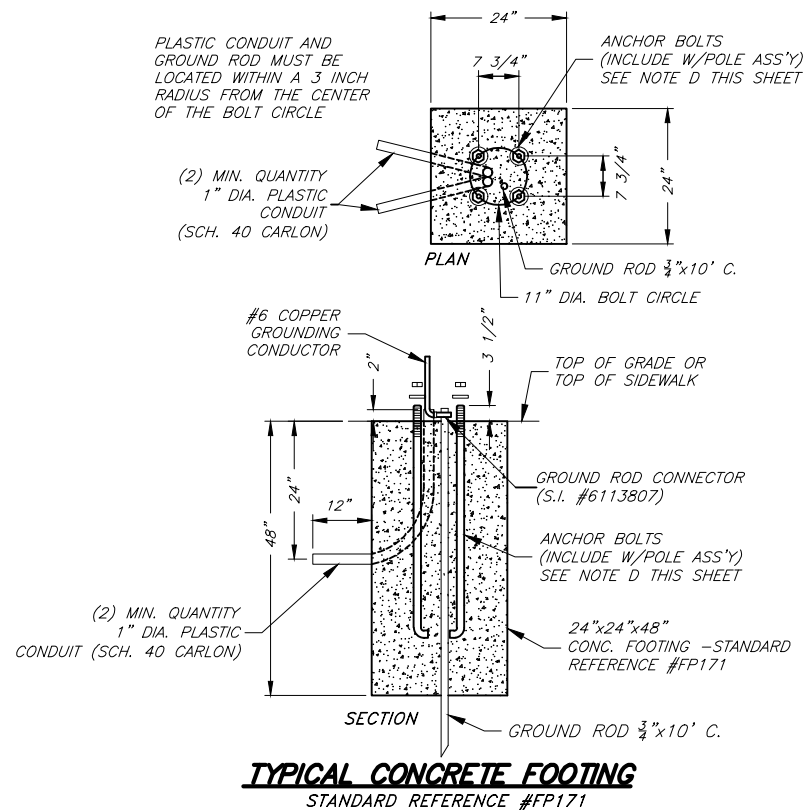
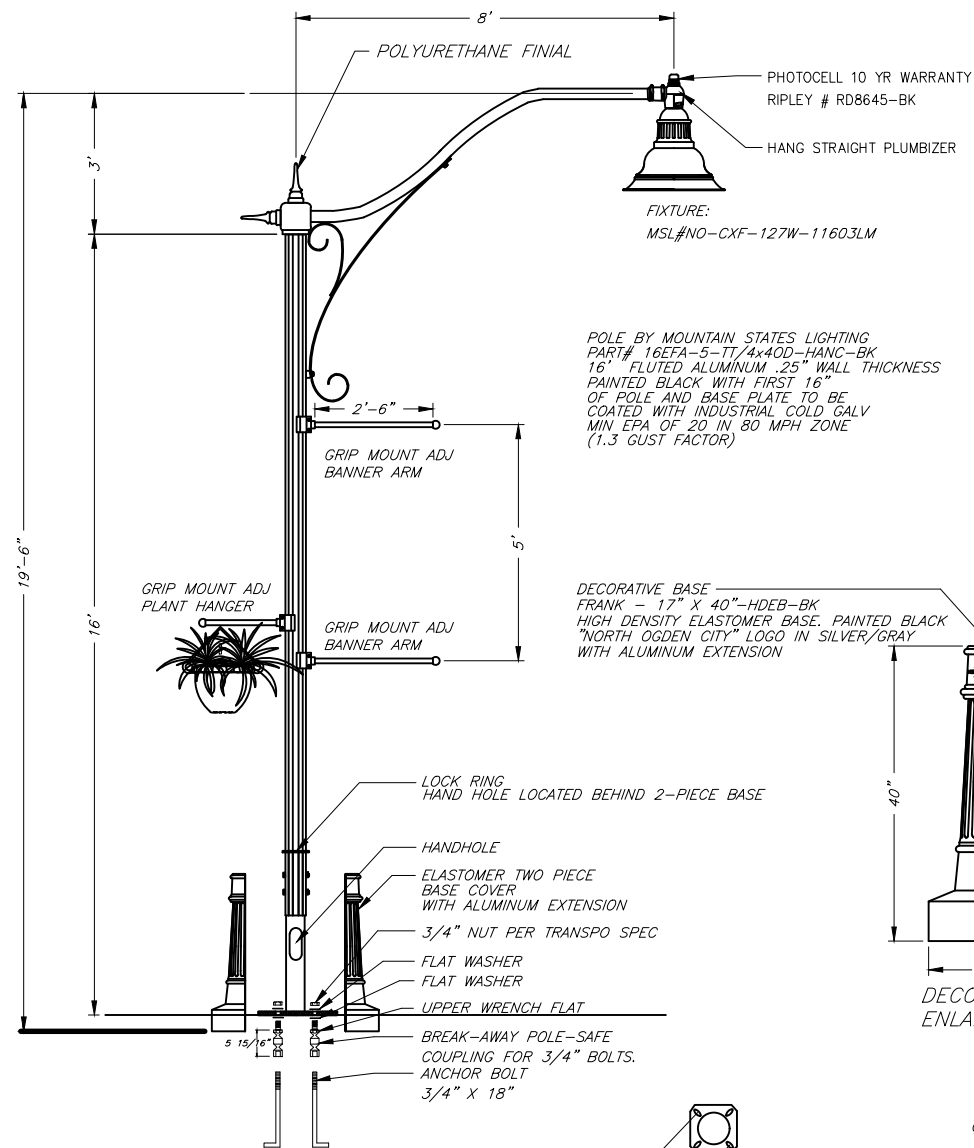
NO.	DATE	REVISIONS

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
STREET LIGHTING STANDARDS - GENERAL LIGHTING

PROJECT NUMBER 2020-0125
SHEET 35 OF 58
SHEET NUMBER LT-0
Page 50



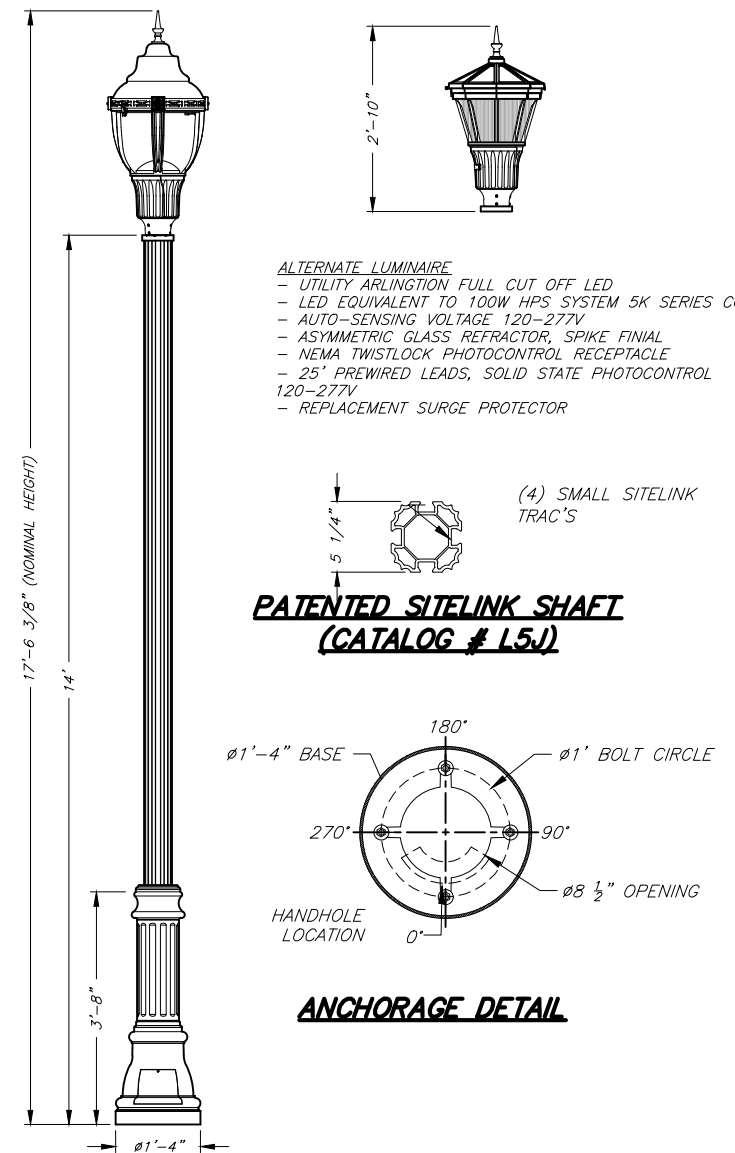
THE FOOTING AS SPECIFIED ON THIS STANDARD IS DESIGNED FOR USE WITH THE STD. 11 GA. (OR 10 GA.) METAL STREET LIGHT POLES FOR MOUNTING HEIGHTS UP TO 32 FEET. IT SHOULD NOT BE APPLIED IN LOCATIONS WHICH REQUIRE A POLE OF HIGHER STRENGTH (SUCH AS A DEAD-END POLE, COMBINATION STREET LIGHT/TRAFFIC SIGNAL POLE, OR ETC.)

FOOTING NOTES:

- (A) FOOTINGS WILL GENERALLY BE INSTALLED BY A CONTRACTOR. FOOTINGS SHOULD BE LOCATED WITH THE VERTICAL C 24" + BACK FROM THE EDGE OF CURB.
- (B) THE MANUFACTURER SHALL FURNISH (4) ANCHOR BOLTS, (1) GROUND ROD & PLASTIC CONDUITS FOR EACH FOOTING AS REQ'D.
- (C) NUMBER AND ORIENTATION OF THE PLASTIC CONDUITS ARE INFLUENCED BY THE UNDERGROUND CIRCUIT ROUTE AND SHOULD BE DETERMINED IN EACH LOCATION FOR THE MOST PRACTICAL SOLUTION.
- (D) ANCHOR BOLTS SHALL BE FURNISHED WITH 6" MIN. THREAD LENGTH AND SHALL BE HOT DIP GALV.

OR EQUAL PRODUCTS

OTHER LIGHT POLES AND LUMINAIRES CAN BE USED UPON APPROVAL OF THE PUBLIC WORKS INSPECTOR. OR EQUAL PRODUCTS SHOULD BE OF SIMILAR QUALITY AND DURABILITY. DIRECT BURY COMPOSITE LIGHT POLES HAVE NOT BEEN AS DURABLE AND THEREFORE ARE NOT EXPECTED TO BE USED.



DECORATIVE LIGHT POLE WITHOUT MAST ARM

POST DESCRIPTION
THE LIGHTING POST SHALL BE ALL ALUMINUM CONSTRUCTION CONSISTING OF A POLE TOP ADAPTER PLATE, PATENTED SITELINK SL5 SERIES SHAFT AND A DECORATIVE FLUTED CAST ALUMINUM BASE.

MATERIALS
THE BASE SHALL BE HEAVY WALL, CAST ALUMINUM PRODUCED FROM CERTIFIED ASTM 356.1 INGOT PER ASTM B-179-95A OR ASTM B26-95. THE SHAFT SHALL BE EXTRUDED FROM ALUMINUM, ASTM 6061 ALLOY, HEAT TREATED TO A T6 TEMPER. ALL HARDWARE SHALL BE TAMPER RESISTANT STAINLESS STEEL. ANCHOR BOLTS TO BE COMPLETELY HOT DIP GALVANIZED.

DIMENSIONS
THE POST SHALL BE 14'-0" IN HEIGHT WITH A Ø16" BASE. A HAND HOLE SHALL BE PROVIDED FOR ACCESS.

INSTALLATION
THE POST SHALL BE PROVIDED WITH FOUR, HOT DIP GALVANIZED L-TYPE ANCHOR BOLTS TO BE INSTALLED ON A 12" DIAMETER BOLT CIRCLE. A DOOR SHALL BE PROVIDED IN THE BASE FOR ANCHORAGE AND WIRING ACCESS. A GROUNDING SCREW SHALL BE PROVIDED INSIDE THE BASE OPPOSITE THE DOOR.

FINISH
THE ENTIRE ASSEMBLY SHALL BE ANODIZED AND THEN RECEIVE A STANDARD HOLOPHANE POWDER COAT FINISH OVER THE ANODIZED MATERIAL.

- LUMINAIRE**
- UTILITY WASHINGTON POSTLITE FULL CUT OFF LED
 - 70W DRIVER 5K AUTO-SENSING 120-277V
 - ASYMMETRIC FULL CUTOFF LED, SPIKE FINIAL
 - NEMA TWISTLOCK PHOTOCONTROL RECEPTACLE
 - DTL TWISTLOCK PHOTOCONTROL 120-277V
 - 25' PREWIRED LEADS

NO.	DATE	DESCRIPTION

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
STREET LIGHTING STANDARDS - DECORATIVE LIGHTING

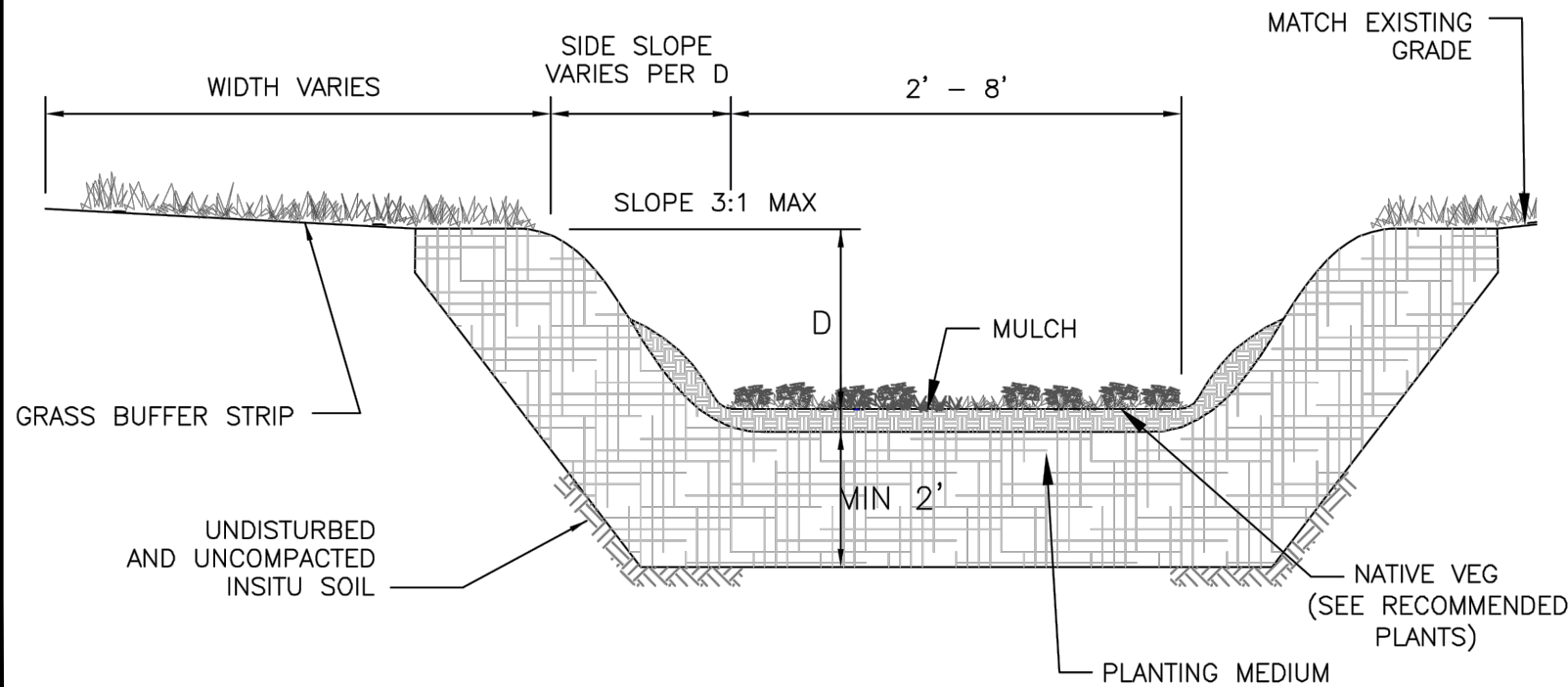
PROJECT NUMBER 2020-0125
SHEET 36 OF 58
SHEET NUMBER LT-0

CONSTRUCTION SEQUENCING:

1. PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES.
2. INSTALL SILT FENCE ALONG THE PERIMETER OF THE SITE TO PREVENT SEDIMENT FROM LEAVING THE SITE DURING THE CONSTRUCTION PROCESS.
3. ALL DOWNGRADIENT PERIMETER SEDIMENT-CONTROL BMPs MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND-DISTURBING ACTIVITY.
4. REMOVE TOPSOIL FROM THE SITE AND PLACE IN TEMPORARY STOCKPILE LOCATION. TEMPORARY SEED THE STOCKPILE.
5. INSTALL UNDERGROUND UTILITIES (WATER, SANITARY SEWER, ELECTRIC AND PHONES) TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPs INTO CONSIDERATION.
6. SEED AND MULCH DISTURBED AREAS ON SITE.
7. CONSTRUCT THE ROADS TAKING THE LOCATION AND FUNCTION OF STORM WATER BMPs INTO CONSIDERATION.
8. PERFORM ALL OTHER SITE IMPROVEMENTS TAKING THE LOCATION AND FUNCTION OF THE SOTRM WATER BMPs INTO CONSIDERATION.
9. FINAL GRADE THE SITE.
10. STABILIZE THE SITE BY IMPLEMENTING THE NATIVE SEEDING AND PLANTING PORTION OF THE LANDSCAPING PLAN.
11. INSTALL THE EROSION CONTROL BLANKET AND COIR ROLL/CHECK DAMS.
12. REMOVE THE SILT FENCE AFTER THE SITE IS STABILIZED PER PROJECT ENGINEER APPROVAL.

GENERAL NOTES:

1. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE START OF ANY CONSTRUCTION OPERATION THAT MAY CAUSE ANY SEDIMENTATION OR SILTATION AT THE SITE.
2. INSTALL STORM DRAIN INLET PROTECTION TO PREVENT CLOGGING OF THE STORM SEWER AND SEDIMENT LOADS TO THE DOWNSTREAM STORM WATER FACILITIES OR WATERBODIES.
3. GRADING OF THE SWALE SHALL BE ACCOMPLISHED USING LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. SMALL TRACKED DOZERS AND BOBCATS WITH RUNNER TRACKS ARE RECOMMENDED.
4. EXCAVATE THE SWALE TO THE SPECIFIED DEPTH (ELEVATION). IT IS RECOMMENDED THAT ALL SUB MATERIAL BELOW THE SPECIFIED ELEVATION SHALL BE LEFT UNDISTURBED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
5. GRADE TO THE DEPTH (ELEVATION) SPECIFIED IN THE CONSTRUCTION DOCUMENTS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
6. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE BMP DURING OR IMMEDIATELY FOLLOWING EXCAVATION, THIS MATERIAL WILL NEED TO BE REMOVED FROM THE SWALE PRIOR TO INITIATING THE NEXT STEP IN THE CONSTRUCTION PROCESS. THIS IS ESPECIALLY IMPORTANT IF THE SWALE HAS BEEN DESIGNED TO INFILTRATE STORM WATER: SEDIMENT THAT HAS BEEN WASHED INTO THE SWALE DURING THE EXCAVATION PROCESS CAN SEAL THE PERMEABLE MATERIAL, SIGNIFICANTLY REDUCING THE INFILTRATION CAPACITY OF THE SOILS.
7. MATERIAL EXCAVATED FROM THE SWALE(S) SHALL BE DISPOSED OF ON-SITE AT LOCATIONS (STOCKPILE AREAS) DESIGNATED BY ENGINEER.
8. NON-STANDARD COMPONENT: CLEAN, WASHED 1.5 TO 3.5-INCH GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE SWALE TO THE DEPTH SPECIFIED IN THE CONSTRUCTION DOCUMENTS. GRAVEL SHOULD BE PLACED IN LIFTS AND LIGHTLY COMPACTED WITH PLATE COMPACTORS.
9. NON-STANDARD COMPONENT: THE PERFORATED PIPE (UNDERDRAIN) SHALL BE LAID DIRECTLY ON THE GRAVEL BED. GRADE AND ALIGNMENT SHALL NOT VARY FROM THE PRESCRIBED GRADE BY MORE THAN 0.03 FEET AT ANY POINT. THE JOINTS BETWEEN SECTIONS OF PIPE SHALL BE CONNECTED IN A FASHION ACCEPTABLE TO ENGINEER. ONCE THE PIPE IS IN PLACE, IT SHALL BE COVERED IMMEDIATELY WITH GRANULAR MATERIAL AS SPECIFIED IN THE CONSTRUCTION DOCUMENTS. THE GRANULAR MATERIAL SHALL BE OF UNIFORM DEPTH ON BOTH SIDES OF THE PIPE. SPECIAL INLETS AND SPECIAL DEVICES AT THE OUTLET END OF THE PIPE SHALL BE CONSTRUCTED AS SHOWN IN THE PLANS.
10. PORTIONS OF SWALE TO BE PLANTED SHALL RECEIVE 3" OF WOODCHIP MULCH.
11. PORTIONS OF SWALE TO BE SEEDED SHALL BE MULCHED WITH CLEAN GRAIN STRAW AT A RATE OF 2 TONS PER ACRE.
12. SEEDING AND INSTALLATION OF EROSION CONTROL BLANKET SHALL BE COMPLETED WITHIN 48 HOURS OF FINAL GRADING.



TYPICAL WET SWALE CROSS-SECTION

DETAIL SOURCED FROM UTAH CITY ENGINEERS ASSOCIATION STANDARD DRAWINGS

NO.	DESCRIPTION	DATE

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
TYPICAL WET SWALE CROSS-SECTION

PROJECT NUMBER 2020-0125	
SHEET 37	OF 58
SHEET NUMBER LID-	

STORM WATER – LOW IMPACT DEVELOPMENT (LID) RECOMMENDED PRACTICES AND DETAILS WET SWALES

BRIEF DESCRIPTION:

WET SWALES ARE A TYPE OF FILTRATION BMP AND OCCUR WHEN THE WATER TABLE IS LOCATED CLOSE TO THE SURFACE. THIS WET SWALE ACTS AS A VERY LONG AND LINEAR SHALLOW WETLAND TREATMENT SYSTEM. LIKE DRY SWALES, THE ENTIRE WATER QUALITY TREATMENT VOLUME IS STORED WITHIN A SERIES OF CELLS CREATED BY CHECK DAMS. CELLS MAY BE PLANTED WITH EMERGENT WETLAND PLANT SPECIES TO IMPROVE POLLUTANT REMOVAL. IT'S RECOMMENDED TO BE PRECEDED BY PRE-TREATMENT TO CAPTURE AND REMOVE COARSE SEDIMENT PARTICLES.

COST RANGE:

- CONSTRUCTION: \$-\$\$
- O&M: \$-\$\$

IDEAL CONDITIONS FOR INSTALLATION:

- PRECIPITATION: LONG DURATION
- SOILS: TYPE C AND D
- GROUNDWATER: SHALLOW

WHERE/APPLICABILITY:

- RESIDENTIAL: LIMITED
- COMMERCIAL: YES
- ULTRA URBAN: NO
- INDUSTRIAL: YES
- HIGHWAY/ROAD: YES
- RETROFIT: YES
- FEASIBILITY: DO NOT USE OVER IMPERVIOUS SOILS

MAINTENANCE:

- FREQUENCY: TWICE YEARLY
- TYPE: VEGETATION MAINTENANCE, CLEANING OF STRUCTURES
- MONITORING: MONITOR FOLLOWING STORM EVENTS
- PERMIT RENEWAL: PERMIT RENEWAL AS REQUIRED FOR MS4



PERFORMANCE:

- TOTAL SUSPENDED SOLIDS (TSS): 20% REMOVAL WITH NO CHECK DAMS, 40% REMOVAL WITH CHECK DAMS
- TOTAL NITROGEN: 15% REMOVAL
- TOTAL METALS: 35% REMOVAL
- OILS AND GREASE: NO DATA
- PATHOGENS: NO DATA

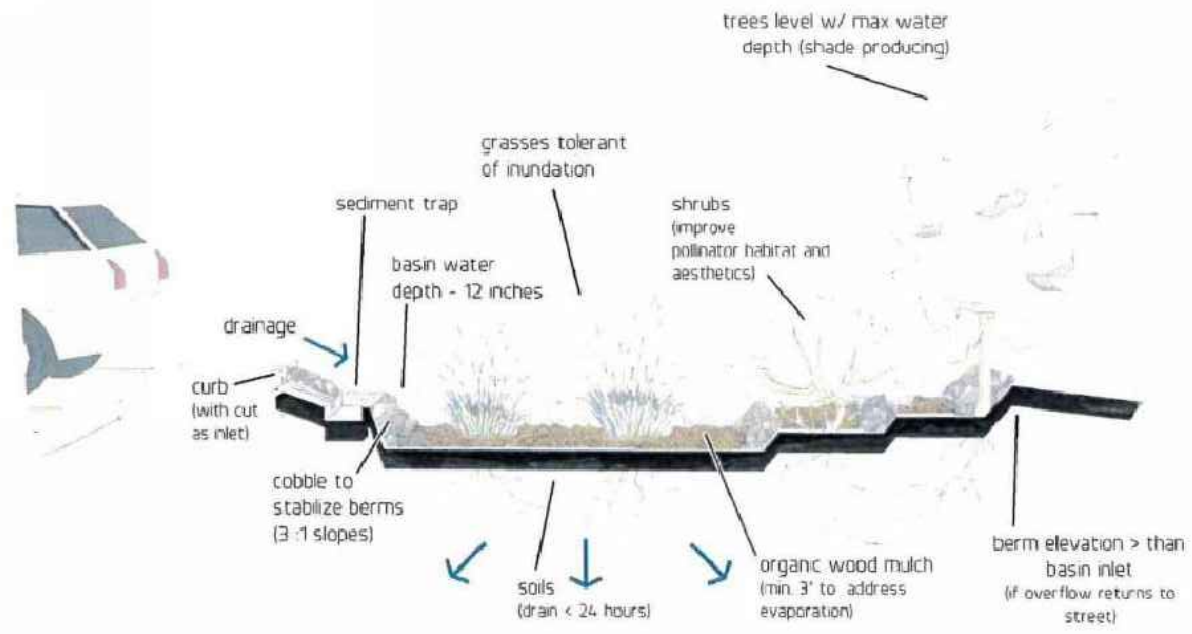
NO.	DESCRIPTION	DATE

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
WET SWALES

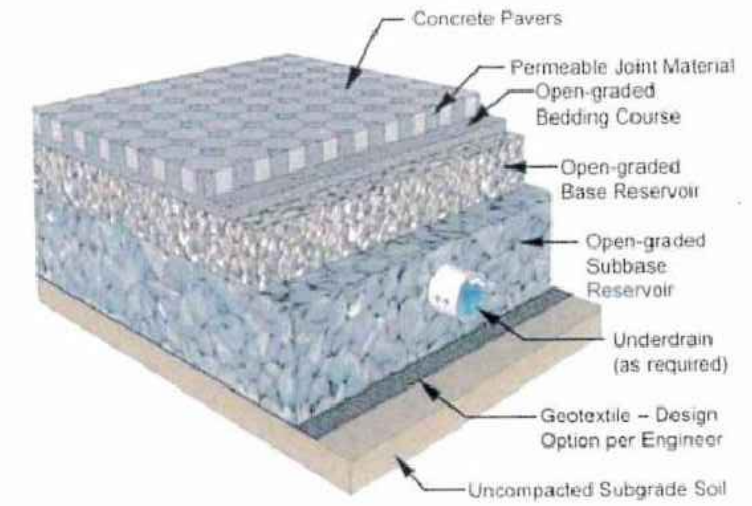
PROJECT NUMBER	2020-0125		
SHEET	38	OF	58
SHEET NUMBER	LID-0		



Basic Basin Design Considerations

RAIN GARDEN
 *** http://www.lid-stormwater.net/site_map.htm ***

diagram by
 Paul Navrat
 for SUH



PERMEABLE PAVER

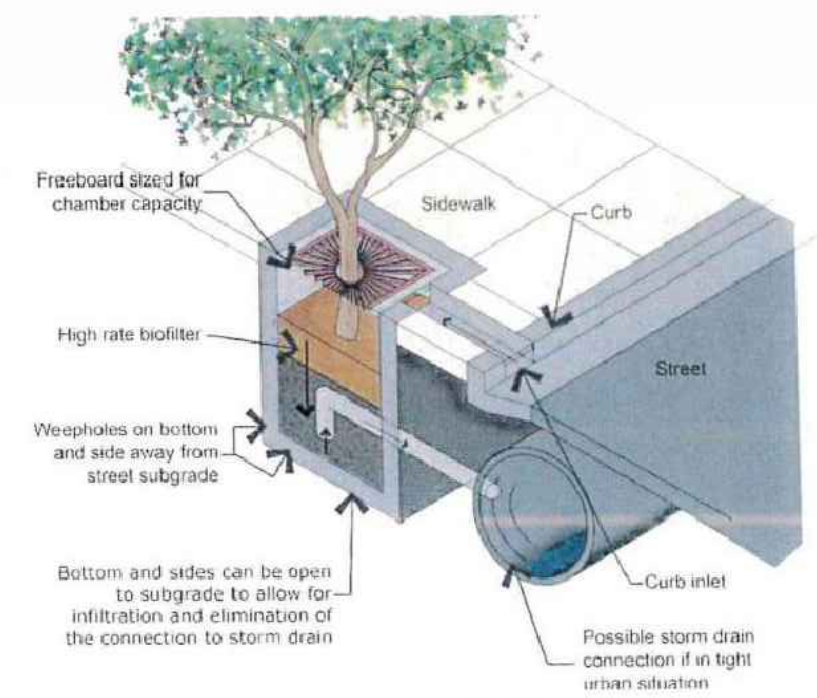
From Smith, D. 2006. *Permeable Interlocking Concrete Pavement-selection design, construction and maintenance, Third Edition*. Interlocking Concrete Pavement Institute, Herndon, VA



RAIN BARREL

*** <http://www.goodideasinc.com/products/rain-barrels/rain-wizard-50/> ***

DISCLAIMER:
 ALL LID EXAMPLES SHOWN ON THIS SHEET ARE FOR REFERENCE PURPOSES ONLY. ANY SPECIFIC WEBSITES, COMMERCIAL PRODUCTS, PROCESS OR SERVICE BY TRADE NAME, TRADEMARK, MANUFACTURER, OR OTHERWISE, DOES NOT CONSTITUTE OR IMPLY ITS ENDORSEMENT, RECOMMENDATION, OR FAVORING BY NORTH OGDEN CITY. THE PURPOSE OF PROVIDING SPECIFIC PRODUCT INFORMATION IS TO ENSURE THAT THE CONTRACTOR AND/OR DEVELOPER HAS ALL THE APPROPRIATE INFORMATION AND REFERENCES TO ASSESS THE USEFULNESS OF THE PRODUCT.



TREE BOX FILTER

From www.wbdg.org

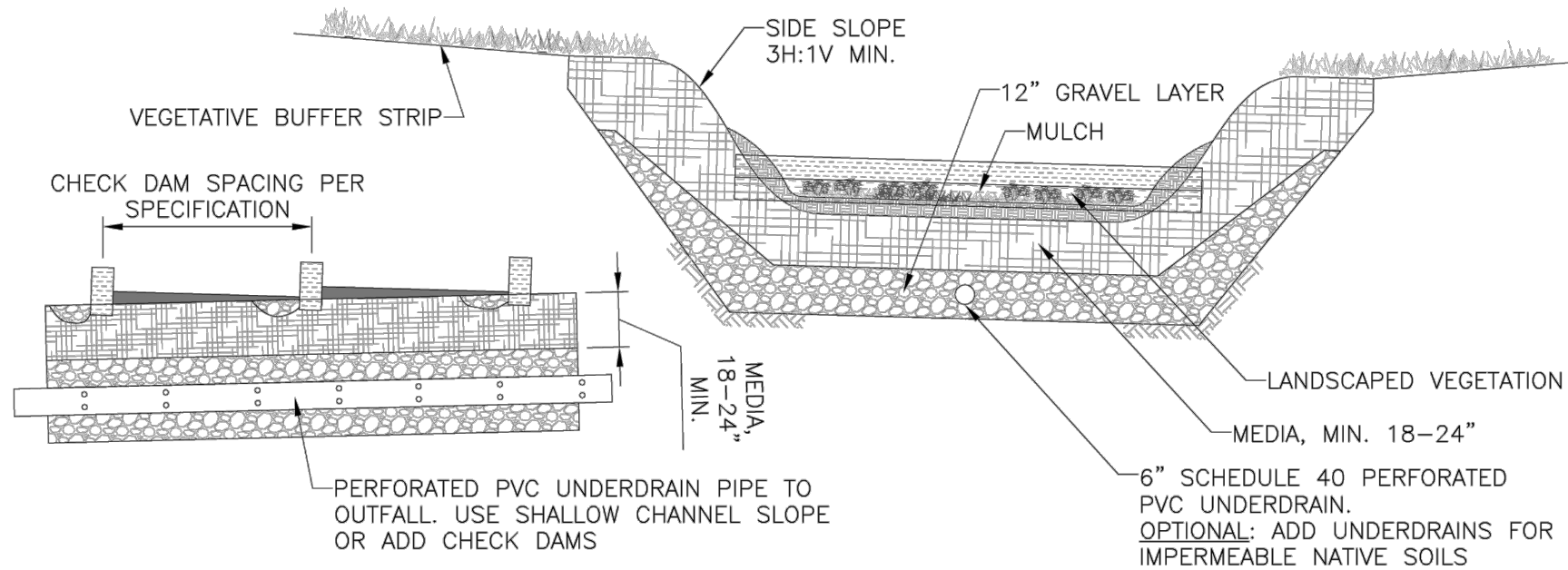
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PROJECT MANAGER	A. THOMPSON
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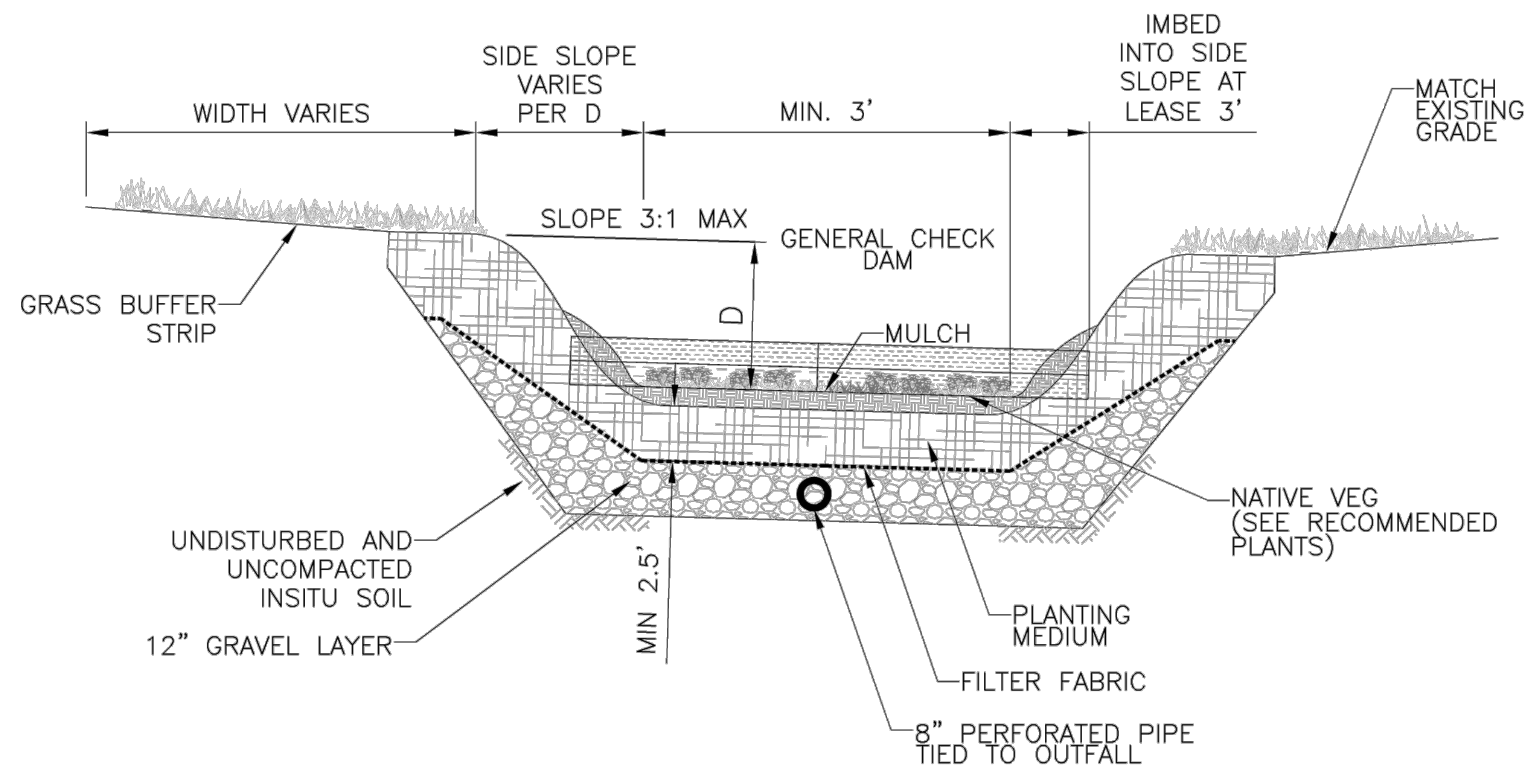
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NORTH OGDEN CITY CORPORATION
 PUBLIC WORKS STANDARDS
 GENERAL - LID (LOW IMPACT DEVELOPMENT) EXAMPLES

PROJECT NUMBER	2020-0125
SHEET	39 OF 58
SHEET NAME	LID- Page 54



TYPICAL DRY SWALE CROSS-SECTION



TYPICAL DRY SWALE CROSS-SECTION W/ CHECK DAM

CONSTRUCTION SEQUENCING:

1. PERFORM CONTINUOUS INSPECTIONS OF EROSION CONTROL PRACTICES.
2. INSTALL SILT FENCE ALONG THE PERIMETER OF THE SITE TO PREVENT SEDIMENT FROM LEAVING THE SITE DURING THE CONSTRUCTION PROCESS.
3. ALL DOWNGRADE PERIMETER SEDIMENT-CONTROL BMPs MUST BE IN PLACE BEFORE ANY UP GRADIENT LAND-DISTURBING ACTIVITY BEGINS.
4. REMOVE TOPSOIL FROM THE SITE AND PLACE IN TEMPORARY STOCKPILE LOCATION. TEMPORARILY SEED THE STOCKPILE.
5. INSTALL UNDERGROUND UTILITIES (WATER SANITARY SEWER, ELECTRIC AND PHONES) TAKING THE LOCATION AND FUNCTION OF THE STORM WATER BMPs IN CONSIDERATION.
6. SEED AND MULCH DISTURBED AREAS ON SITE.
7. CONSTRUCT THE ROADS TAKING THE LOCATION AND FUNCTION OF THE STORMWATER BMPs IN CONSIDERATION.
8. PERFORM ALL OTHER SITE IMPROVEMENTS TAKING THE LOCATION AND FUNCTION OF THE STORMWATER BMPs IN CONSIDERATION.
9. FINAL GRADE THE SITE.
10. STABILIZE THE SITE BY IMPLEMENTING THE NATIVE SEEDING AND PLANTING PORTION OF THE LANDSCAPING PLAN.
11. INSTALL THE EROSION CONTROL BLANKET AND COIR ROLL/CHECK DAMS.
12. REMOVE THE SILT FENCE AFTER THE SITE IS STABILIZED PER PROJECT ENGINEER APPROVAL.

GENERAL NOTES:

1. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE START OF ANY CONSTRUCTION OPERATION THAT MAY CAUSE AND SEDIMENTATION OF SILTATION OF THE SITE.
2. INSTALL STORM DRAIN INLET PROTECTION TO PREVENT CLOGGING OF THE STORM SEWER AND SEDIMENT LOADS TO DOWNSTREAM STORM WATER FACILITIES OR WATERBODIES.
3. GRADING OF THE SWALE SHALL BE ACCOMPLISHED USING LOW-IMPACT EARTH-MOVING EQUIPMENT TO PREVENT COMPACTION OF THE UNDERLYING SOILS. SMALL TRACKED DOZERS AND BOBCATS WITH RUNNER TRACKS ARE RECOMMENDED.
4. EXCAVATE THE SWALE TO THE SPECIFIED DEPTH (ELEVATION). IT IS RECOMMENDED THAT ALL SUB MATERIAL BELOW THE SPECIFIED ELEVATION SHALL BE LEFT UNDISTURBED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
5. GRADE TO THE DEPTH (ELEVATION) SPECIFIED IN THE CONSTRUCTION DOCUMENTS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
6. IN THE EVENT THAT SEDIMENT IS INTRODUCED INTO THE SWALE DURING OR IMMEDIATELY FOLLOWING EXCAVATION. THIS MATERIAL WILL NEED TO BE REMOVED FROM THE SWALE PRIOR TO INITIATING THE NEXT STEP IN THE CONSTRUCTION PROCESS. THIS IS ESPECIALLY IMPORTANT IF THE SWALE HAS BEEN DESIGNED TO INFILTRATE STORM WATER. SEDIMENT THAT HAS BEEN WASHED INTO THE SWALE DURING THE EXCAVATION PROCESS CAN SEAL THE PERMEABLE MATERIAL, SIGNIFICANTLY REDUCING THE INFILTRATION CAPACITY OF THE SOILS.
7. MATERIAL EXCAVATED FROM THE SWALE(S) SHALL BE DISPOSED OF ON-SITE AT LOCATIONS (STOCKPILE AREAS) DESIGNATED BY ENGINEER.
8. NON-STANDARD COMPONENT: CLEAN, WASHED 1.5 TO 3.5-INCH GRAVEL SHALL BE PLACED IN THE BOTTOM OF THE SWALE TO THE DEPTH SPECIFIED IN THE CONSTRUCTION DOCUMENTS. GRAVEL SHOULD BE PLACED IN LIFTS AND LIGHTLY COMPACTED WITH PLATE COMPACTORS.
9. NON-STANDARD COMPONENT: THE PERFORATED PIPE (UNDERDRAIN) SHALL BE LAID DIRECTLY ON THE GRAVEL BED. GRADE AND ALIGNMENT SHALL NOT VARY FROM THE PRESCRIBED GRADE BY MORE THAN 0.03 FEET AT ANY POINT. THE JOINTS BETWEEN SECTIONS OF PIPE SHALL BE CONNECTED IN A FASHION ACCEPTABLE TO ENGINEER. ONCE THE PIPE IS IN PLACE, IT SHALL BE COVERED IMMEDIATELY WITH GRANULAR MATERIAL AS SPECIFIED IN THE CONSTRUCTION DOCUMENTS. THE GRANULAR MATERIAL SHALL BE OF UNIFORM DEPTH ON BOTH SIDES OF THE PIPE. SPECIAL INLETS AND SPECIAL DEVICES AT THE OUTLET END OF THE PIPE SHALL BE CONSTRUCTED AS SHOWN IN THE PLANS.
10. PORTIONS OF SWALE TO BE PLANTED SHALL RECEIVE 3" OF WOODCHIP MULCH.
11. PORTIONS OF SWALE TO BE SEEDDED SHALL BE MULCHED WITH CLEAN GRAIN STRAW AT A RATE OF 2 TONS PER ACRE.
12. SEEDING AND INSTALLATION OF EROSION CONTROL BLANKET SHALL BE COMPLETED WITHIN 48 HOURS OF FINAL GRADING.

NO.	DESCRIPTION	DATE

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
TYPICAL DRY SWALE CROSS-SECTION

PROJECT NUMBER 2020-0125
SHEET 40 OF 58
SHEET NUMBER LID-0

STORM WATER – LOW IMPACT DEVELOPMENT (LID) RECOMMENDED PRACTICES AND DETAILS DRY SWALES

BRIEF DESCRIPTION:

A DRY SWALE IS A SHALLOW, GENTLY SLOPING DRAINAGE CHANNEL WITH BROAD, VEGETATED SIDE SLOPES. SWALES PROVIDE TEMPORARY STORAGE, FILTRATION, AND INFILTRATION OF STORMWATER RUNOFF. A DRY SWALE IS VERSATILE BECAUSE THE AREA IT COVER IS RELATIVELY SMALL. THEY CAN BE USED IN PLACE OF CURBS, GUTTERS, AND STORM DRAINAGE SYSTEMS. REDUCED CHANNEL VELOCITIES INCREASE INFILTRATION AND WATER QUALITY TREATMENT. IT EFFECTIVELY REDUCES AND RETARDS PEAK RUNOFF. CHANNEL VEGETATION CAN INCLUDE TURF, MEADOW GRASS, SHRUBS AND – IN LIMITED QUANTITIES – SMALL TREES. THEY ARE ALWAYS LOCATED ABOVE THE WATER TABLE TO PROVIDE DRAINAGE.

COST RANGE:

- CONSTRUCTION: \$
- O&M: \$

IDEAL CONDITIONS FOR INSTALLATION:

- PRECIPITATION: ALL
- SOILS: PERMEABLE
- GROUNDWATER: DEEP

WHERE/APPLICABILITY:

- RESIDENTIAL: YES
- COMMERCIAL: YES
- ULTRA URBAN: YES
- INDUSTRIAL: YES
- HIGHWAY/ROAD: YES
- RETROFIT: YES

MAINTENANCE:

- FREQUENCY: YEARLY
- TYPE: MOW, TRIM, SEDIMENT REMOVAL
- MONITORING: NO
- PERMIT RENEWAL: NO



PERFORMANCE:

- TOTAL SUSPENDED SOLIDS (TSS): HIGH
- CHLORIDE: LOW
- TOTAL NITROGEN: MEDIUM
- OILS AND GREASE: HIGH
- PATHOGENS: LOW

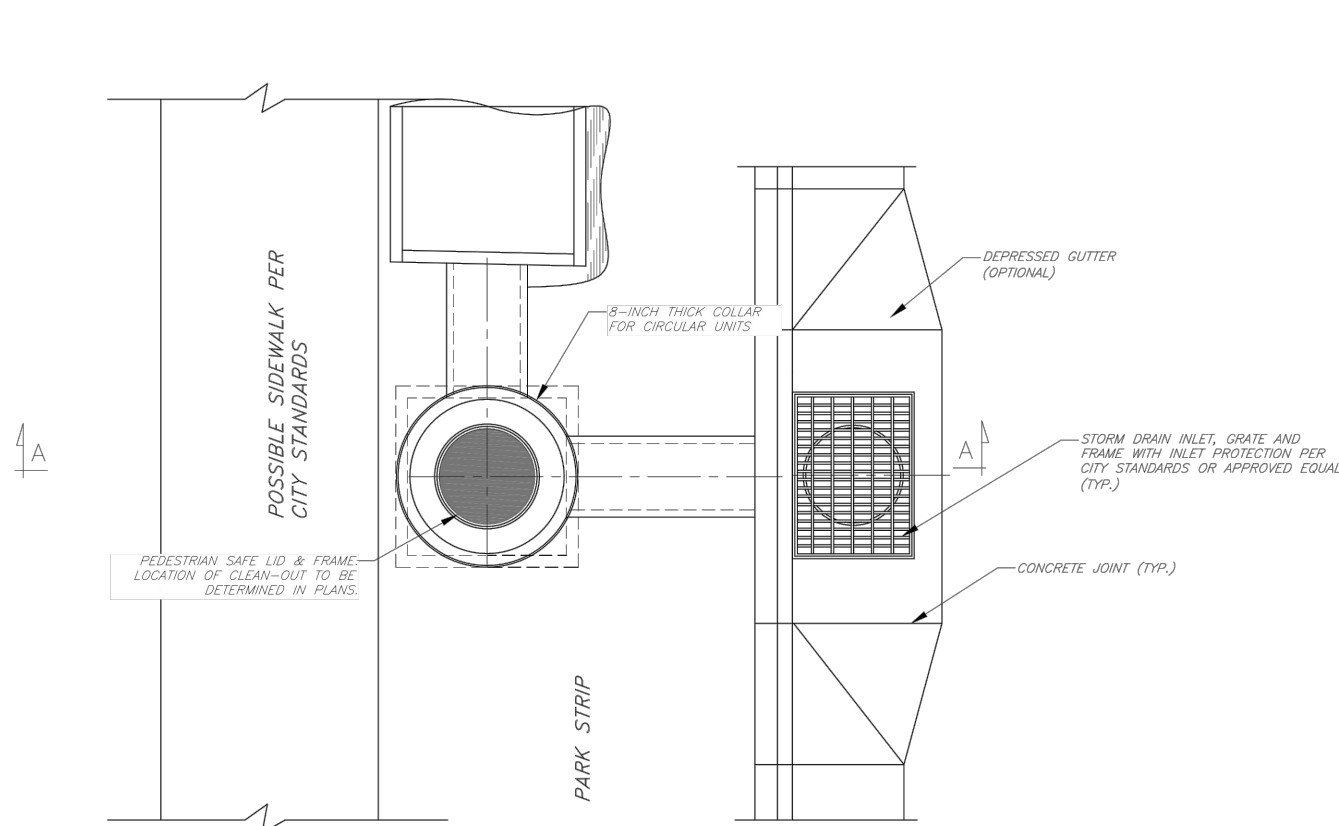
NO.	DESCRIPTION	DATE
7.		

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	8/31/2022

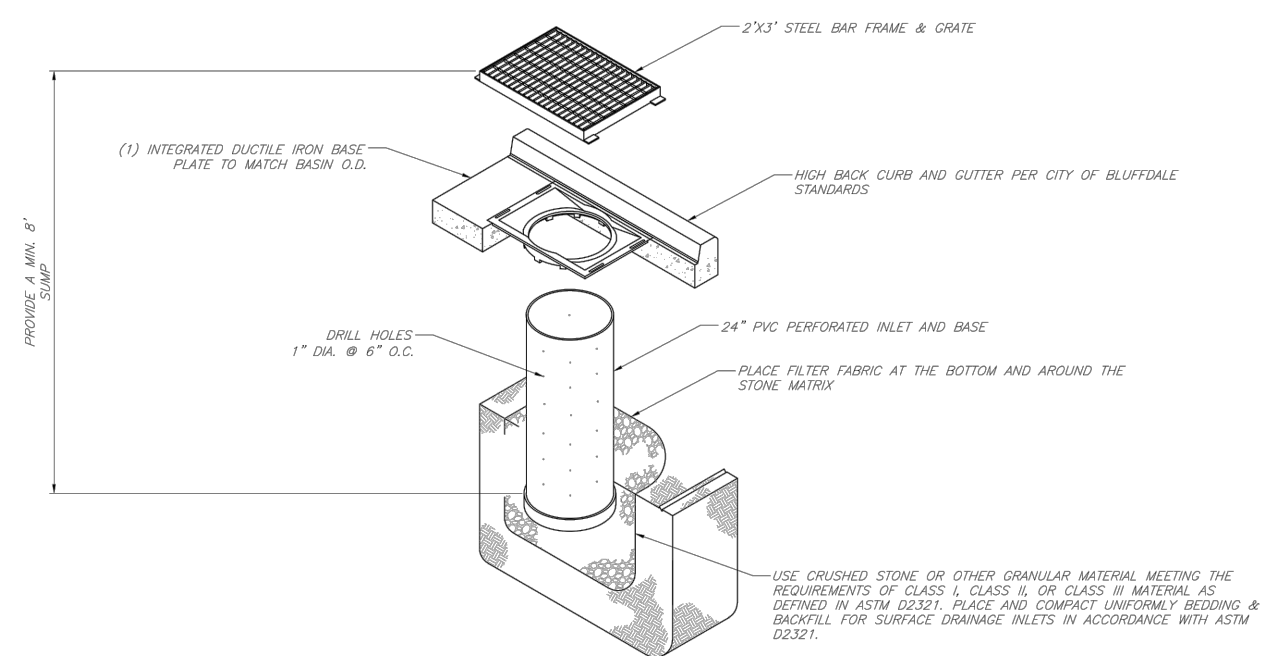
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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
DRY SWALES

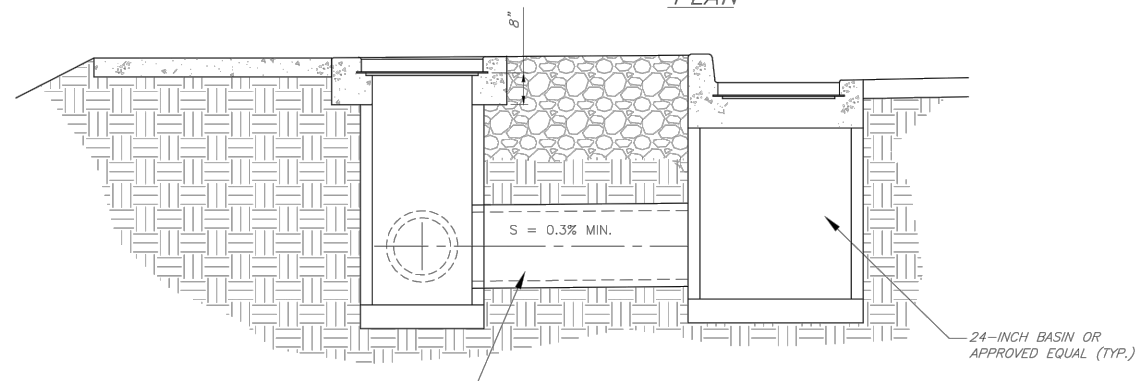
PROJECT NUMBER	2020-0125
SHEET	41
OF	58
SHEET NUMBER	LID-0



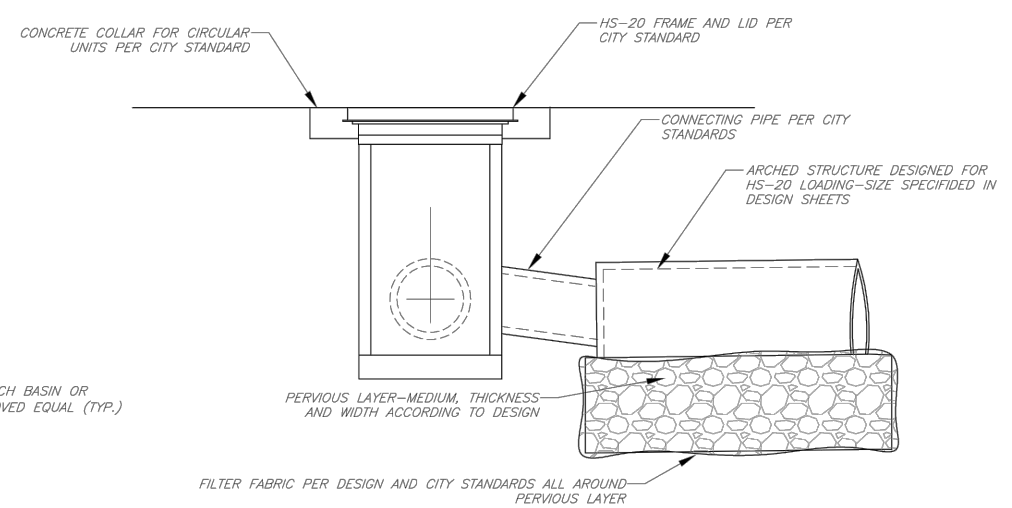
PLAN



GENERIC INFILTRATION GALLERIES (ALTERNATE)



SECTION A-A



- NOTES:**
1. USE COATED DEFORMED REINFORCING STEEL BARS CONFORMING TO AASHTO M 284 OR M 111 AND M 31 GRADE 60 RESPECTIVELY OR GFRP BARS ACCORDING TO THE LATEST AASHTO STANDARDS.
 2. FIELD CUT AND BEND REINFORCING STEEL TO CLEAR PIPES AND MAINTAIN 2" COVER. REPAIR ANY DAMAGE OR CUTS TO THE EPOXY COATING ON REINFORCING BARS.
 3. USE CONCRETE CLASS 4000 PSI (APWA 033004)
 4. USE TYPE II OR V CEMENT (LOW ALKALI)
 5. FOR TYPE, NUMBER, LOCATION, AND SIZE OF PIPE AND OTHER STRUCTURES SEE PLANS.
 6. SEE PLANS FOR DEPRESSION DIMENSIONS.
 7. PROVIDE 3/4" CHAMFER ON ALL EXPOSED CONCRETE CORNERS.
 8. PROVIDE PRE-TREATMENT UNIT FROM APPROVED LIST
 9. USE ONLY STRUCTURES AND PIPE MATERIALS ACCORDING TO STANDARDS AND AS APPROVED BY THE CITY.

GENERIC INFILTRATION GALLERIES

NO.	REVISION	DATE

PRINCIPAL
 M. CHANDLER
 PROJECT MANAGER
 A. THOMPSON
 CHECKED BY
 A. THOMPSON
 DRAWN BY
 O. CURTIS
 DRAWING SCALE
 N.T.S.
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NORTH OGDEN CITY CORPORATION
 PUBLIC WORKS STANDARDS
 GENERIC INFILTRATION GALLERIES

PROJECT NUMBER	2020-0125
SHEET	42 OF 58
SHEET NUMBER	LID-0

STORM WATER – LOW IMPACT DEVELOPMENT (LID) RECOMMENDED PRACTICES AND DETAILS INFILTRATION GALLERIES

BRIEF DESCRIPTION:

TYPICALLY, AN INFILTRATION GALLERY IS A STRUCTURE THAT IS DESIGNED TO DISSIPATE STORMWATER THROUGH A PERVIOUS MEDIUM OF STRAIGHT GRADED ROCKS. THESE GALLERIES CAN INCLUDE DOME STRUCTURE THAT SIT ON A PERVIOUS LAYER OF VARIOUS THICKNESS, THROUGH WHICH THE WATER PENETRATES THE GROUND, AND PERFORATED PIPES OF VARIOUS CAPACITY DEPENDING ON ITS DESIGN, SURROUNDED BY A PERVIOUS LAYER.

COST RANGE:

- CONSTRUCTION: \$\$\$
- O&M: \$

IDEAL CONDITIONS FOR INSTALLATION:

- PRECIPITATION: CAN BE DESIGNED FOR HIGH INTENSITY AND LONG DURATION
- SOILS: A, B, POSSIBLE C DEPENDING ON HYDRAULIC TRANSMISSION RATE
- GROUNDWATER: BELOW THE STRUCTURE LOWEST PART

WHERE/APPLICABILITY:

- RESIDENTIAL: YES, AWAY FROM STRUCTURE FOUNDATIONS
- COMMERCIAL: YES, AWAY FROM STRUCTURE FOUNDATIONS
- ULTRA URBAN: LIMITED
- INDUSTRIAL: YES
- HIGHWAY/ROAD: YES, AWAY FROM ROAD FOUNDATION SYSTEM
- RETROFIT: LIMITED

MAINTENANCE:

- FREQUENCY: YEARLY IN DRY CLIMATE
- TYPE: VISUAL INSPECTION, REMOVE ACCUMULATED FINES AND DEBRIS
- MONITORING: ANNUAL VISUAL INSPECTION
- PERMIT RENEWAL: NO

PERFORMANCE:

- TOTAL SUSPENDED SOLIDS (TSS) – FINE: MEDIUM
- TOTAL SUSPENDED SOLIDS (TSS) – COARSE: HIGH
- CHLORIDE: N/A
- TOTAL NITROGEN: N/A
- METALS: MEDIUM
- OILS AND GREASE: MEDIUM
- PATHOGENS: HIGH

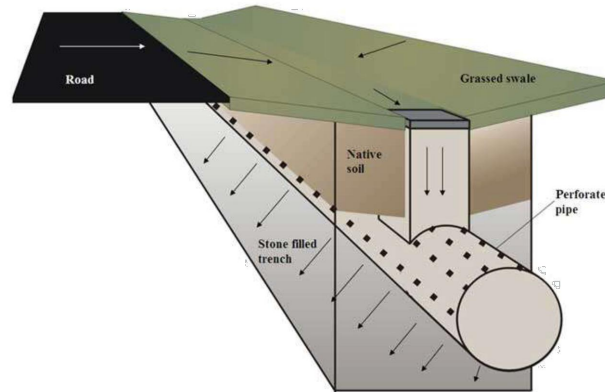
CONSTRUCTION SEQUENCE:

DOMES:

1. DESIGN THE SYSTEM FOR THE APPROPRIATE UNDERLYING SOILS INFILTRATION RATE, WITH A VOLUME OF RETENTION ACCORDING TO STORM FREQUENCY VOLUME TO BE CONTAINED.
2. EXCAVATE THE TRENCH SUFFICIENTLY WIDE, LONG, AND DEEP TO PLACE THE PERVIOUS LAYER.
3. AT THE PROPER ELEVATION, PLACE THE FILTER FABRIC AT THE BOTTOM OF THE TRENCH, THE FABRIC SHOULD BE WIDE AND LONG ENOUGH TO ENVELOP THE PERVIOUS LAYER THAT IS BELOW THE ACTUAL DOME.
4. ONCE THE MATRIX IS IN PLACE AND IS WRAPPED IN FABRIC, THE DOME CAN BE INSTALLED ON THE FLATTEN MATRIX ON TOP OF THE FABRIC.
5. CONTINUE THE OPERATION FOR EACH SEGMENT OF THE SYSTEM.
6. CONNECT THE DOME SYSTEM AND STRUCTURE TO THE INLET PIPES PER DESIGN.
7. BACKFILL AND COMPACT IN LAYERS (8-INCH TO 12-INCH) TO 96% MOD. PROCTOR.

PERFORATED PIPES:

1. DESIGN THE SYSTEM FOR THE APPROPRIATE UNDERLYING SOILS INFILTRATION RATE, WITH A VOLUME OF RETENTION ACCORDING TO STORM FREQUENCY VOLUME TO BE CONTAINED.
2. EXCAVATE THE TRENCH SUFFICIENTLY WIDE, LONG AND DEEP TO PLACE THE PERVIOUS LAYER (STONE MATRIX).
3. PLACE OUTER FILTER FABRIC IN THE TRENCH TO KEEP THE FINES FROM MIGRATING FROM THE NATIVE INTO THE PERVIOUS LAYER.
4. PLACE LAYER OF PERVIOUS MATERIAL AS PER DESIGNED THICKNESS AND WIDTH.
5. PLACE FILTER FABRIC THAT WILL WRAP THE PIPE.
6. PLACE THE PERFORATED PIPES, CONNECTING IT.
7. FOLLOW MANUFACTURER RECOMMENDATIONS FOR THE INSTALLATION OF FILTER AND MATRIX ENVELOPE AROUND THE PIPE FOR PROPER BACKFILLING AND COMPLETE INSTALLATION OF THE SYSTEM.



SPECIFICATIONS:

PRETREATMENT IS RECOMMENDED TO REMOVE SEDIMENTS AND FLOATABLES. IN GENERAL, FOLLOW MANUFACTURER SPECIFICATIONS.

FOLLOWING IS A POSSIBLE SPECIAL

SECTION INCLUDES:

- MATERIALS AND PROCEDURES FOR INSTALLING THE SYSTEMS.
- TYPE, SIZE, THICKNESS DESIGNATION.

RELATED SECTIONS:

- EMBANKMENT, BORROW AND BACKFILL – EXCAVATION – STORM DRAIN SYSTEMS

REFERENCES:

- AASHTO LFRD SECTION 12.12 – ASTM F2787, F2418, F2922

NOTES:

1. USE COATED DEFORMED REINFORCING STEEL BARS CONFORMING TO AASHTO M 284 OR M 111 AND M 31 GRADE 60 RESPECTIVELY OR GRFP BARS ACCORDING TO THE LATEST AASHTO STANDARDS.
2. FIELD CUT AND BEND REINFORCING STEEL TO CLEAR PIPES AND MAINTAIN 2" COVER. REPAIR ANY DAMAGE OR CUTS TO THE EPOXY COATING ON REINFORCING BARS.
3. USE CONCRETE CLASS 4000 PSI (APWA 0.33004).
4. USE TYPE II OR V CEMENT (LOW ALKALI).
5. FOR TYPE, NUMBER, LOCATION, AND SIZE OF PIPE AND OTHER STRUCTURES SEE PLANS.
6. SEE PLANS FOR DEPRESSION DIMENSIONS.
7. PROVIDE 3/4" CHAMFER ON ALL EXPOSED CONCRETE CORNERS.
8. PROVIDE PRE-TREATMENT UNIT FROM APPROVED LIST.
9. USE ONLY STRUCTURES AND PIPE MATERIALS ACCORDING TO STANDARDS AND AS APPROVED BY THE CITY.

DEFINITIONS:

PIPE AND PIPE ARCH ARE IDENTIFIED ACCORDING TO DIAMETER OR BY SPAN AND RISE, THE FOLLOWING DEFINITIONS, AND ACCORDING TO CORROSION CLASS.

1. COVER – THE VERTICAL EXTENT OF SOIL ABOVE THE CROWN OF THE PIPE OR CULVERT. REFER TO DG SERIES STANDARD DRAWINGS.
2. CROSS CULVERT – A TRANSVERSE DRAIN COVERED WITH EMBANKMENT THAT ALLOWS SURFACE RUNOFF TO PASS UNDER THE EMBANKMENT.
3. END SECTION – A STRUCTURE COMMONLY MADE OF STEEL OR CONCRETE THAT IS ATTACHED TO ONE OR BOTH ENDS OF A CULVERT OR A PIPE TO RETAIN THE EMBANKMENT, IMPROVE APPEARANCE, PROVIDE ANCHORAGE, IMPROVE DISCHARGE, AND LIMIT SCOUR AT THE OPENING.
4. HEADWALL – A STRUCTURE COMMONLY MADE OF CONCRETE, PLACED AT THE END OF CULVERT INLET OR OUTLET OR STORM DRAIN OUTLET, TO ANCHOR THE PIPE, TO RETAIN THE HIGHWAY EMBANKMENT NEAR THE PIPE END, AND TO PROTECT THE PIPE ENDS FROM BANK EROSION AND CHANNEL BED SCOUR.
5. INVERT – THE FLOOR, BOTTOM, OR LOWEST PART OF THE INTERNAL CROSS SECTION OF A CULVERT, CONDUIT, OR STORM DRAIN.
6. PAVED INVERT – LINING OF CONCRETE, BITUMINOUS, OR OTHER MATERIALS PLACED IN THE INVERT TO PROTECT THE INVERT FROM ABRASION OR TO IMPROVE THE CULVERT HYDRAULICS.
7. RISE – THE VERTICAL HEIGHT DIMENSION OF THE BOX, PIPE ARCH, AND ARCH STRUCTURE.
8. SKEW – THE ANGLE BETWEEN A LINE PERPENDICULAR TO THE ROADWAY CENTERLINE AND THE LONGITUDINAL DIRECTION OF THE CULVERT BARREL.
9. SOFFIT – THE INSIDE TOP OR ROOF OF A CULVERT, CONDUIT, OR STORM-DRAIN PIPE.
10. SPAN – THE HORIZONTAL DIMENSION OF A BOX CULVERT, PIPE ARCH, OR ARCH STRUCTURE.

SUBMITTALS:

- PROVIDE A MANUFACTURER'S CERTIFICATE OF COMPLIANCE SHOWING

THE PRODUCT MEETS THE REFERENCED SPECIFICATIONS.

- FURNISH A CERTIFICATION OF COMPLIANCE FROM THE MANUFACTURER CERTIFYING COATING THICKNESS.

MATERIALS:

- FILTER FABRIC

STRUCTURE TYPES:

- PERFORATED CORRUGATED ALUMINIZED PIPES.
- PERFORATED CORRUGATED METAL PIPE.
- PVC ARCH

SYSTEM SELECTION:

1. USE THE SAME TYPE AND STRENGTH OR THICKNESS FOR THE ENTIRE SYSTEM.
2. USE THE MAXIMUM HEIGHT OF COVER TO DETERMINE THE STRENGTH OR THICKNESS OF THE SYSTEM ELEMENTS.
3. PERFORATED CORRUGATED AND SMOOTH-LINED HIGH DENSITY POLYETHYLENE PIPES (HDPE) – USE ONLY HDPE PLASTIC PIPE UP TO 60-INCH DIAMETER THAT IS CERTIFIED BY AASHTO NATIONAL TRANSPORTATION PRODUCT EVALUATION PROGRAM (NTPPEP) TO MEET AASHTO M 294 REQUIREMENTS AND PROVIDE A COPY OF NTPPEP CERTIFICATION TO THE ENGINEER.
4. PERFORATED CORRUGATED AND SMOOTH-LINED PVC PIPES – USE UP TO 36 INCH DIAMETER.
5. DO NOT USE PRECAST, NON-REINFORCED CONCRETE PIPE GREATER THAN 18 INCH IN DIAMETER.
6. DO NOT ALLOW PIPES OF DIFFERENT TYPES OF METAL TO CONTACT EACH OTHER. USE MATCHING MATERIALS TO MAKE DIRECT EXTENSIONS OF EXISTING PIPES.
7. DO NOT USE PIPE CONTAINING LONGITUDINAL LAP SEAMS IF WATERTIGHT PIPE OR WATERTIGHT JOINTS ARE REQUIRED.
8. DO NOT USE THERMOPLASTIC SYSTEMS MANUFACTURED WITHOUT UV INHIBITORS APPROVED BY THE MATERIALS ENGINEER IN APPLICATIONS SUBJECT TO DIRECT SUNLIGHT.

EXECUTION:

DOMES:

- EXCAVATE THE TRENCH SUFFICIENTLY WIDE, LONG AND DEEP TO PLACE THE PERVIOUS LAYER (STONE MATRIX).
- AT THE PROPER ELEVATION, PLACE THE FILTER FABRIC AT THE BOTTOM OF THE TRENCH, THE FABRIC SHOULD BE WIDE AND LONG TO ENVELOP THE PERVIOUS LAYER THAT IS BELOW THE ACTUAL DOME.
- ONCE THE MATRIX IS IN PLACE AND IS WRAPPED IN FABRIC, THE DOME CAN BE INSTALLED ON THE FLATTEN MATRIX ON THE TOP OF THE FABRIC.
- CONTINUE THE OPERATION FOR EACH SEGMENT OF THE SYSTEM.
- CONNECT THE DOME SYSTEM AND STRUCTURE TO THE INLET PIPES PER DESIGN.
- BACKFILL AND COMPACT IN LAYERS (8 INCH TO 12 INCH) TO 96% MOD. PROCTOR.

PERFORATED PIPES:

- EXCAVATE THE TRENCH SUFFICIENTLY WIDE, LONG AND DEEP TO PLACE THE PERVIOUS LAYER (STONE MATRIX).
- PLACE OUTER FILTER FABRIC IN THE TRENCH TO KEEP THE FINES FROM MIGRATING FROM THE NATIVE INTO THE PERVIOUS LAYER.
- PLACE THE PERFORATED PIPES, CONNECTING IT.
- FOLLOW MANUFACTURER RECOMMENDATIONS FOR THE INSTALLATION OF FILTER AND MATRIX ENVELOPE AROUND THE PIPE FOR PROPER BACKFILLING AND COMPLETE INSTALLATION OF THE SYSTEM.
- BACKFILL AND COMPACT IN LAYERS (8 INCH TO 12 INCH) TO 96% MOD. PROCTOR.

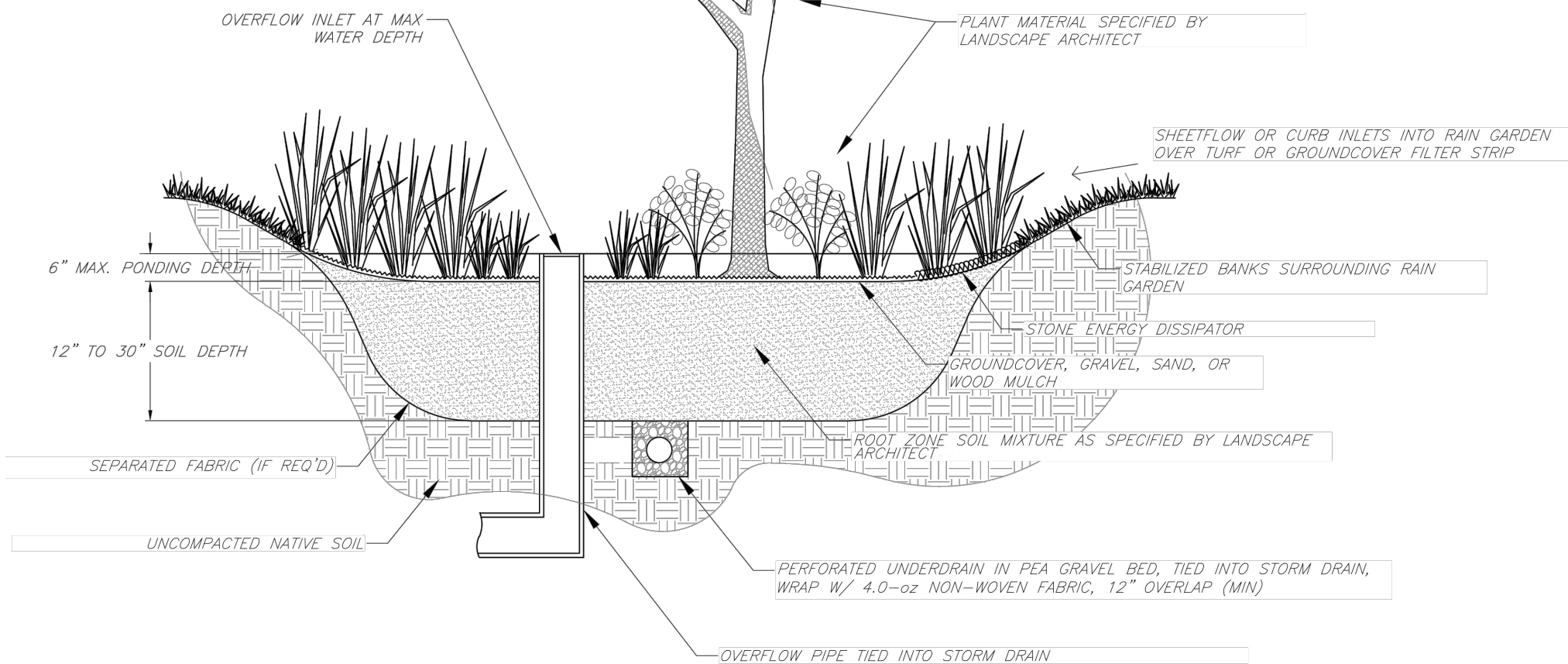
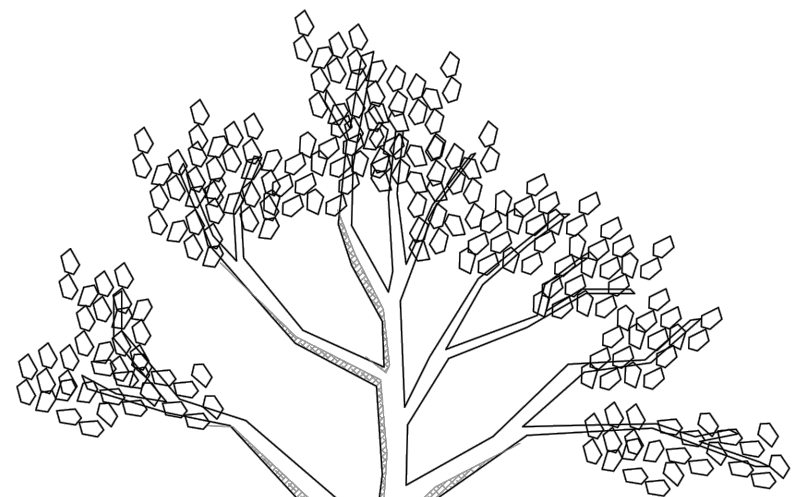
NO.	DATE	DESCRIPTION
7.		

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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GENERIC INFILTRATION GALLERIES

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CONSTRUCTION SEQUENCE:

1. ADHERE TO APPROVED SWPPP DOCUMENTS FOR CONSTRUCTION BMP'S.
2. INSTALL UNDERGROUND UTILITIES (WATER, SANITARY SEWER, ELECTRIC AND PHONES) TAKING THE LOCATION AND FUNCTION OF STORM WATER BMP'S INTO CONSIDERATION.
3. GRADE THE RAIN GARDEN FEATURE PER APPROVED CONSTRUCTION DOCUMENTS ACCOUNTING FOR UNDERDRAINS (IF ANY) AND THEIR INVERT ELEVATIONS AND CONNECTIONS TO OUTLETS, SIDE SLOPES GEOMETRY, LONGITUDINAL SLOPE (IF ANY) AND OVER-EXCAVATION REQUIREMENTS. DO NOT COMPACT BEDS OR SIDE SLOPES.
4. INSTALL NON-WOVEN GEOTEXTILE FABRIC OVER THE BED AREA INCLUDING THE BOTTOM AND SIDES.
5. BACKFILL OVER THE FABRIC WITH UNIFORM DRAIN ROCK (1/2" TO 1-1/2") TO SPECIFIED DEPTH (TYPICALLY 6" TO 16").
6. INSTALL PERFORATED SUBDRAIN (IF INCLUDED) AND CONNECT TO OUTLET SYSTEM. SUBDRAIN IS POSITIONED NEAR THE TOP OF THE DRAIN ROCK BACKFILL LAYER.
7. INSTALL NON-WOVEN GEOTEXTILE FABRIC OVER DRAIN ROCK BEDDING.
8. PLACE BIO-RETENTION LAYER FILL MATERIAL ACCORDING TO DESIGNATED DEPTH AND SPECIFIED SOIL COMPOSITION. PROVIDE ADEQUATE PROTECTION OF UNDERDRAIN FEATURES DURING CONSTRUCTION ACTIVITY TO PREVENT BREAKAGE OR SIGNIFICANT DEFLECTION.
9. PLANT OR SEED THE RAIN GARDEN WITH DROUGHT-TOLERANT VEGETATION APPROPRIATE TO THE SPECIFIC LOCALE. PLACE MULCH COVER AFTER PLANTS ARE INSTALLED, SEEDED RAIN GARDENS TYPICALLY EXCLUDE MULCH: [HTTPS://CWEL.USU.EDU/FILES/UTAH_HOUSE_PLANT_LIST_V2_4P.PDF](https://cwel.usu.edu/files/utah_house_plant_list_v2_4p.pdf) FOR NATIVE DROUGHT TOLERANT VEGETATION LISTINGS.
10. REMOVE THE SILT FENCE AND OTHER TEMPORARY EROSION CONTROL FEATURES AFTER THE SITE IS STABILIZED PER PROJECT ENGINEER APPROVAL.

NOTES:

1. RAIN GARDEN SUBGRADES SHALL NOT BE COMPACTED NOR SUBJECT TO HEAVY CONSTRUCTION EQUIPMENT <800 LB PER SQ FT/6 PSI. AFTER TRIBUTARY AREAS ARE STABILIZED, LIGHT CONSTRUCTION EQUIPMENT (SKID STEER WITH TRACKS) TO BE USED TO SCARIFY BED TO LINE AND GRADE.
2. UPON COMPLETION OF SUB-GRADE WORK, THE ENGINEER SHALL BE NOTIFIED AND SHALL INSPECT AT HIS/HER DISCRETION BEFORE PROCEEDING WITH BIORETENTION INSTALLATION.
3. INSTALL NONWOVEN 4-OZ TO 6-OZ SEPARATION GEOTEXTILE FABRIC PER MANUFACTURER RECOMMENDATIONS FOR OVERLAP. SECURE FABRIC IN PLACE WITH GRAVEL PILES TO PREVENT MOVEMENT BY WIND AND CONSTRUCTION ACTIVITY.
4. PLACE DRAIN ROCK FILL TO SPECIFIED DEPTH. ROCK SHALL BE SINGLE-GRADED BETWEEN 1/2" AND 1-1/2" AND MAY BE CRUSHED OR ROUNDED.
5. INSTALL PERFORATED COLLECTION UNDERDRAIN (IF REQUIRED) USING SCHEDULE 80 PVC OR HDPE MEETING AASHTO M252. PIPE SOCK IS NOT REQUIRED, AND TYPICAL PERFORATION PATTERNS FROM MANUFACTURERS ARE ACCEPTABLE.
6. INSTALL VEGETATION PER LANDSCAPE PLANS BETWEEN APRIL 1 AND SEPT 15, OR AS WEATHER AND CLIMATE SUPPORT EARLY PLANT GROWTH, AND AS WEATHER AND CLIMATE SUPPORT EARLY PLANT GROWTH, AND AS APPROVED BY LANDSCAPE ARCHITECT.
7. INSTALL 8" X 3/4" REBAR WITH CAP AT EACH CORNER OF RAIN GARDEN BED, SUCH THAT CAP IS AT GRADE WITH FINISHED BIO-RETENTION SURFACE FOR FUTURE INSPECTION PURPOSES.
8. INSTALL 3" OF MINIMUM 6-MONTH OLD BARK MULCH OR 2" OF ROCK MUGH EXCEPT IN AREAS FINISHED WITH SOD OR SEED.
9. MAINTAIN SWPPP IMPLEMENTS UNTIL THE ENTIRE SITE IS VEGETATED AND STABILIZED. ENGINEER TO APPROVE OPERATION OF THE RAIN GARDEN.
10. VEGETATION SHALL RECEIVE WATER BY HAND-WATERING OR FROM WETTING RAIN EVENTS (1/2" RAINFALL OR MORE) DAILY FOR A MINIMUM OF TWO WEEKS IMMEDIATELY FOLLOWING PLANTING.
11. CONTRACTOR SHALL PROVIDE A 100% WARRANTY ON CARE AND REPLACEMENT OF PLATED VEGETATION FOR 12 MONTHS COMMENCING ON THE DATE OF PROJECT ACCEPTANCE BY ENGINEER.
12. ALL MATERIAL TO MEET SPECIFICATIONS.
13. RAIN GARDEN AREA MUST BE SIZED APPROPRIATELY FOR SITE CONDITIONS.
14. ALL PLANT MATERIAL TO BE SPECIFIED BY LANDSCAPE ARCHITECT.
15. SITE MUST BE FULLY STABILIZED PRIOR TO RAIN GARDEN CONSTRUCTION.

NO.	DESCRIPTION	DATE

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
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ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
RAIN GARDEN

PROJECT NUMBER 2020-0125
SHEET 44 OF 58
SHEET NUMBER LID-

STORM WATER – LOW IMPACT DEVELOPMENT (LID) RECOMMENDED PRACTICES AND DETAILS RAIN GARDENS

BRIEF DESCRIPTION:

A RAIN GARDEN IS A DEPRESSED AREA IN THE LANDSCAPE THAT COLLECTS RAIN WATER FROM A ROOF, DRIVEWAY, OR STREET AND ALLOWS IT TO SOAK INTO THE GROUND. MORE COMPLEX RAIN GARDENS WITH DRAINAGE SYSTEMS AND AMENDED SOILS ARE OFTEN REFERRED TO AS BIORETENTION.

COST RANGE:

- CONSTRUCTION: \$-\$\$
- O&M: \$-\$\$\$

IDEAL CONDITIONS FOR INSTALLATION:

- PRECIPITATION: NATURAL HYDROLOGY CYCLE
- SOILS: SOIL GROUPS A, B ARE IDEAL; C, D WITH AMENDMENTS AND/OR UNDERDRAIN
- GROUNDWATER: MINIMUM 1' TO GROUNDWATER

WHERE/APPLICABILITY:

- RESIDENTIAL: YES, YARDS, PARK STRIPS, SWALES
- COMMERCIAL: YES, PARK STRIPS, TREE BOXES, SWALES
- ULTRA URBAN: YES, TREE BOXES, PARK STRIPS
- INDUSTRIAL: LIMITED, LANDSCAPE ISLANDS
- HIGHWAY/ROAD: LIMITED, PARALLEL SWALES
- RETROFIT: LIMITED, TREE BOXES, LANDSCAPE ISLANDS

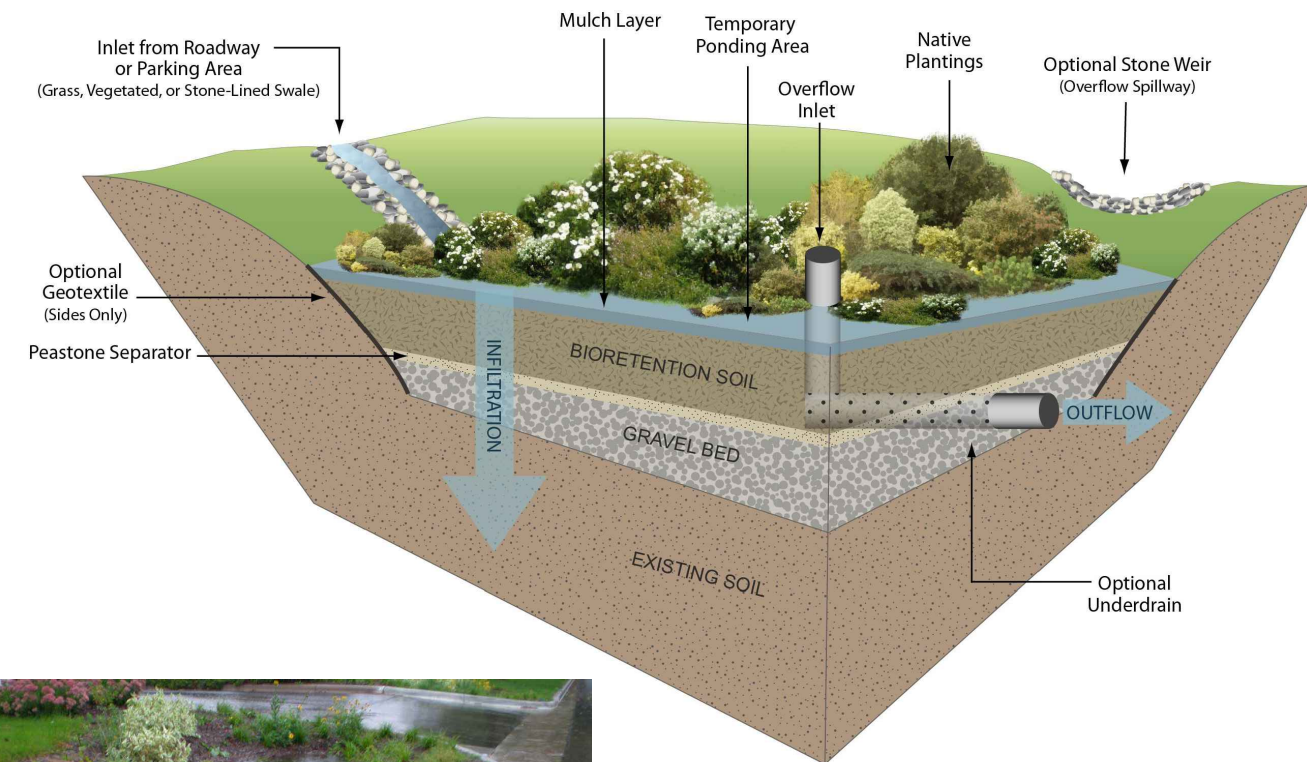
SHOULD BE DESIGNED TO HARMONIZE WITH LANDSCAPING USING NATIVE VEGETATION AND MINIMAL IRRIGATION DEMAND. PROPRIETARY DEVICES MAY OR MAY NOT BE APPROPRIATE.

MAINTENANCE:

- FREQUENCY: ANNUAL
- TYPE: REMOVE ACCUMULATED DEBRIS AS NEEDED
- MONITORING: ANNUAL, START OR END OF WET SEASON
- PERMIT RENEWAL: 10 YEARS

PERFORMANCE:

- TOTAL SUSPENDED SOLIDS (TSS): HIGH
- CHLORIDE: LOW-MEDIUM
- TOTAL NITROGEN: LOW-MEDIUM
- OILS AND GREASE: LOW-HIGH
- PATHOGENS: LOW-MEDIUM



NO.	DESCRIPTION	DATE

7.

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
RAIN GARDEN

PROJECT NUMBER	2020-0125
SHEET	45 OF 58
SHEET NUMBER	LID-5

CONSTRUCTION NOTES:

1. CONSTRUCTION OF THE PERMEABLE PAVEMENT BEGINS AFTER THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED. THE PROPOSED SITE SHOULD BE CHECKED FOR EXISTING UTILITIES PRIOR TO ANY EXCAVATION.
2. TEMPORARY EROSION AND SEDIMENT CONTROLS ARE NEEDED DURING INSTALLATION TO DIVERT STORMWATER AWAY FROM THE PERMEABLE PAVEMENT AREA UNTIL IT IS CONSTRUCTED AND CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED BY A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF AT LEAST 70 PERCENT OVER THE ENTIRE PERVIOUS SURFACE AREA, OR OTHER EQUIVALENT MEANS. SPECIAL PROTECTION MEASURES SUCH AS EROSION CONTROL FABRICS MAY BE NEEDED TO PROTECT VULNERABLE SIDE SLOPES FROM EROSION DURING AND AFTER THE EXCAVATION PROCESS. THE PROPOSED PERMEABLE PAVEMENT AREA MUST BE KEPT FREE FROM SEDIMENT DURING THE ENTIRE CONSTRUCTION PROCESS.
3. WHERE POSSIBLE EXCAVATION SHOULD WORK FROM THE SIDES AND OUTSIDE THE FOOTPRINT OF THE PERMEABLE PAVEMENT AREA (TO AVOID SOIL COMPRESSION). CONTRACTORS CAN UTILIZE A "CELL" CONSTRUCTION APPROACH WHEREBY THE PROPOSED PERMEABLE PAVEMENT AREA IS DIVIDED INTO 500 TO 1000 SQUARE FEET TEMPORARY CELLS WITH 10 TO 15 FEET WIDE EARTHEN BRIDGES BETWEEN THEM SO THAT THE CELLS CAN BE EXCAVATED FROM THE SIDE. THEN THE EARTHEN BRIDGES ARE REMOVED. EXCAVATED MATERIAL SHOULD BE PLACED AWAY FROM THE OPEN EXCAVATION TO MAINTAIN STABILITY OF THE SIDE WALLS.
4. THE NATIVE SOILS ALONG THE BOTTOM OF THE PERMEABLE PAVEMENT SYSTEM CAN BE SCARIFIED OR TILLED TO A DEPTH OF 3 TO 4 INCHES AND GRADED PRIOR TO THE PLACEMENT OF THE AGGREGATE.
5. GEOTEXTILE SHALL BE INSTALLED ON THE SIDES OF THE RESERVOIR AS DETAILED.
6. DO NOT INSTALL PERVIOUS CONCRETE OR POROUS ASPHALT IN RAIN OR SNOW, AND DO NOT INSTALL FROZEN AGGREGATE MATERIALS UNDER ANY OF THE SURFACES.
7. CONSTRUCTION MATERIALS CONTAMINATED BY SEDIMENTS MUST BE REMOVED AND REPLACED WITH CLEAN MATERIALS.
8. MOISTEN, PLACE AND LEVEL THE APWA NO. 1 CLEAN SEWER ROCK (APWA 31 05 13) SUBBASE AND COMPACT IT IN MINIMUM 12 INCH THICK LIFTS WITH FOUR PASSES OF A STEEL DRUM STATIC ROLLER UNTIL THERE IS NO VISIBLE MOVEMENT. THE FIRST TWO PASSES ARE IN VIBRATORY MODE AND THE FINAL TWO PASSES IN STATIC MODE. THE FILTER AGGREGATE SHOULD BE MOVED TO FACILITATE MOVEMENT INTO THE RESERVOIR COURSE.
9. PLACE EDGE RESTRAINTS BEFORE THE BASE LAYER, BEDDING AND PAVERS ARE INSTALLED. PERMEABLE INTERLOCKING PAVEMENT SYSTEMS REQUIRE EDGE RESTRAINTS TO PREVENT VEHICLE TIRES FROM MOVING THE PAVERS. EDGE RESTRAINTS MAY BE STANDARD CONCRETE CURBS OR CURB AND GUTTERS.
10. MOISTEN PLACE AND LEVEL THE APWA NO. 4 CLEAN FILL SEWER ROCK (APWA 31 05 13) IN A SINGLE LIFT (4 INCHES THICK). COMPACT IT INTO THE RESERVOIR COURSE BENEATH WITH AT LEAST FOUR (4) PASSES OF A STEEL DRUM STATIC ROLLER UNTIL THERE IS NO VISIBLE MOVEMENT. THE FIRST TWO PASSES ARE IN VIBRATORY MODE, WITH THE FINAL TWO PASSES IN STATIC MODE.
11. PLACE AND SCREED THE BEDDING COURSE MATERIAL (APWA NO. 8 CLEAN PEA GRAVEL 31 05 13)
12. PAVERS MAY BE PLACED BY HAND OR WITH MECHANICAL INSTALLATION EQUIPMENT.
13. FILL GAPS AT THE EDGE OF THE PAVED AREAS WITH CUT PAVERS OR EDGE UNITS. WHEN CUT PAVERS ARE NEEDED, CUT THE PAVERS WITH A PAVER SPLITTER OR MASONRY SAW. CUT PAVERS NO SMALLER THAN ONE-THIRD (1/3) OF THE FULL UNIT SIZE IF SUBJECT TO TIRES.
14. FILL THE JOINTS AND OPENINGS WITH NO. 8 PEA GRAVEL (APWA 31 05 13). SWEEP AND REMOVE EXCESS GRAVEL FROM THE PAVER SURFACE.
15. COMPACT AND SEAT THE PAVERS INTO THE BEDDING COURSE WITH A MINIMUM LOW-AMPLITUDE 5,000LBF, 75 TO 95 HZ PLATE COMPACTOR. DO NOT COMPACT WITHIN 6 FEET OF THE UNRESTRAINED EDGE OF THE PAVERS.
16. THOROUGHLY SWEEP THE SURFACE AFTER CONSTRUCTION TO REMOVE ALL EXCESS AGGREGATE.
17. INSPECT THE AREA FOR SETTLEMENT. ANY PAVING UNITS THAT SETTLE MUST BE RESEED AND INSPECTED.
18. THE CONTRACTOR SHALL RETURN TO THE SITE WITHIN 6 MONTHS, OR AFTER FIRST WINTER, TO TOP UP THE PAVER JOINTS WITH STONES.

DESIGN NOTES:

1. SOILS – SOIL CONDITIONS AND INFILTRATION RATES DETERMINE THE USE OF AN UNDERDRAIN. (NRCS HYDROLOGIC SOILS, GROUP (HSG) C OR D USUALLY REQUIRE AN UNDERDRAIN WHEREAS HSG A AND B SOILS DO NOT.) DESIGNERS SHOULD EVALUATE EXISTING SOIL PROPERTIES DURING INITIAL SITE LAYOUT WITH THE GOAL OF CONFIGURING PERMEABLE PAVEMENT THAT CONSERVES AND PROTECTS SOILS WITH THE HIGHEST INFILTRATION RATES. IN PARTICULAR, AREAS OF HSG A OR B SOILS SHOULD BE CONSIDERED AS PRIMARY LOCATIONS FOR ALL TYPES OF INFILTRATION PRACTICES.
2. IN MOST CASES, PERMEABLE PAVEMENT SHOULD NOT BE SITUATED ABOVE FILL SOILS. DESIGNERS IN COMPACTED FILL SOILS MAY REQUIRE AN IMPERMEABLE LINER AND AN UNDERDRAIN. PERMEABLE PAVEMENTS SHOULD ONLY BE PLACED ON FILL.
3. CONTRIBUTING DRAINAGE AREA – PERMEABLE PAVEMENTS SOMETIMES CAPTURE RUNOFF FROM ADJACENT AREAS, PAVEMENTS, AND ROOFS. RUNOFF FROM PERMEABLE AREAS IS NOT RECOMMENDED DUE TO POTENTIAL CLOGGING OF THE PERMEABLE PAVEMENT. THE AT-GRADE CONTRIBUTING DRAINAGE AREA INTO PERMEABLE PAVEMENT SHOULD GENERALLY NOT EXCEED TWICE THE SURFACE AREA OF THE PERMEABLE PAVEMENT. THIS GUIDELINE HELPS REDUCE THE RATE OF SURFACE SEDIMENTATION. THE 2:1 RATIO CAN BE INCREASED TO NO GREATER THAN 5:1 IF AT LEAST ONE OF THESE CONDITIONS EXIST.
 - 3.1. PERMEABLE PAVEMENT IS RECEIVING RUNOFF FROM ROOFS AS IT TENDS TO BE VERY LOW IN SEDIMENT; OR
 - 3.2. RUNOFF FROM ADJACENT IMPERVIOUS SURFACES REMAINS UNBURDENED WITH SEDIMENT DUE TO EFFECTIVE PRETREATMENT PRIOR TO ENTERING THE PERMEABLE PAVEMENT.
4. PERMEABLE PAVEMENT AND CONTRIBUTING IMPERVIOUS PAVEMENTS ARE ASSUMED TO RECEIVE REGULAR VACUUMING TO REDUCE AND CONTROL SEDIMENT LOADS AND SURFACE CLOGGING POTENTIAL.
5. SOIL SUBGRADE SLOPE – THE SLOPE OF THE SOIL SUBGRADE SHOULD BE AS FLAT AS POSSIBLE (I.E. LESS THAN 1 PERCENT LONGITUDINAL SLOPE) TO ENABLE EVEN DISTRIBUTION OF STORMWATER. LATERAL SLOPES SHOULD BE LESS THAN PERCENT.
6. SOIL SUBGRADE COMPACTION – THIS SHOULD BE AVOIDED WHEREVER POSSIBLE TO MAXIMIZE INFILTRATION. IN SOME SITUATIONS, COMPACTION MAY BE NEEDED FOR SUPPORTING VEHICULAR LOADS. IN SUCH CASES COMPACTION DENSITY AND SUBSEQUENT SOIL INFILTRATION SHOULD BE ASSESSED IN A TEST PITS TO DETERMINE AN ACCEPTABLE SOIL DENSITY AND ITS CONTRIBUTION TO SOIL STRENGTH AND INFILTRATION.
7. EXCAVATION METHODS – EXCAVATION SHOULD BE CONDUCTED IN A MANNER THAT MINIMIZES SOIL SUBGRADE COMPACTION. TRACKED RATHER THAN WHEELED EQUIPMENT IS RECOMMENDED WORKING FROM THE SIDES OF THE EXCAVATION.
8. SURFACE SLOPES – SURFACE SLOPES FOR ALL PERMEABLE PAVEMENT TYPES SHOULD BE AT LEAST 1 PERCENT TO PROVIDE AN ALTERNATIVE MEANS FOR DRAINAGE SHOULD THE SURFACE BECOME COMPLETELY CLOGGED DUE TO LACK OF MAINTENANCE. DESIGNS SHOULD PROVIDE AN ALTERNATIVE MEANS FOR STORMWATER TO ENTER THE AGGREGATE RESERVOIR IF THE PAVEMENT SURFACE SHOULD EVER BECOME CLOGGED, FOR EXTREME STORM EVENTS.
9. OVERFLOW STRUCTURES – PERMEABLE PAVEMENTS ARE NOT DESIGNED TO STORE AND INFILTRATE ALL STORMWATER FROM ALL STORMS. THEREFORE, AN OUTLET OR OUTLETS ARE REQUIRED TO PREVENT WATER FROM RISING INTO AND OVER THE SURFACE.
10. MINIMUM DEPTH TO SEASONAL HIGH WATER TABLE – A HIGH GROUNDWATER TABLE MAY CAUSE SEEPAGE INTO THE BOTTOM OF PERMEABLE PAVEMENT AND PREVENT COMPLETE DRAINAGE. ALSO, SOIL ACTS AS A FILTER FOR POLLUTANTS BETWEEN THE BOTTOM OF THE PAVEMENT BASE AND THE WATER TABLE. THEREFORE, A MINIMUM VERTICAL SEPARATION OF 3 FEET IS REQUIRED BETWEEN THE BOTTOM OF THE PERMEABLE PAVEMENT RESERVOIR LAYER AND THE SEASONAL HIGH GROUNDWATER TABLE.
11. SETBACKS – TO AVOID HARMFUL SEEPAGE, PERMEABLE PAVEMENT SHOULD NOT BE HYDRAULICALLY CONNECTED TO BUILDING FOUNDATION OR BASEMENT WALL, EVEN UNDER THESE CIRCUMSTANCES. GREAT CARE SHOULD BE TAKEN TO AVOID CREATING A WET BASEMENT PROBLEM. IF THERE IS NO LINER, THE PERMEABLE PAVEMENT BASE SHOULD BE 10 FEET OR GREATER FROM STRUCTURES (EPA RECOMMENDS A MINIMUM SETBACK FROM BUILDING FOUNDATIONS OF 10 DOWN-GRADIENT AND 100 FEET UP-GRADIENT. SEE EPA FACTSHEET "STORM WATER TECHNOLOGY FACT SHEET; POROUS PAVEMENT," EPA 832-F-99-023). AGAIN, IT IS THE DESIGNER'S RESPONSIBILITY TO AVOID CREATING A WET BASEMENT PROBLEM. LIKEWISE, PERMEABLE PAVEMENT BASES SHOULD BE HYDRAULICALLY SEPARATED FROM ADJACENT ROAD BASES.
12. PERMEABLE PAVEMENTS WITHOUT UNDERDRAINS INFILTRATE STORMWATER AND SHOULD FOLLOW REQUIREMENTS FOR WELLHEAD PROTECTION (EPA RECOMMENDS A MINIMUM SETBACK OF 100 FEET FROM WATER SUPPLY WELLS). UNDERGROUND UTILITY LINES ARE BEST LOCATED AWAY FROM PERMEABLE PAVEMENT BASES. HOWEVER, IF THEY NEED TO PENETRATE THE BASE, CONSIDERATION SHOULD BE GIVEN TO WATERPROOFING (DEPENDING ON UTILITY) OR POSSIBLE ENCASEMENT USING LOW-STRENGTH FLOWABLE CONCRETE FILL. SETBACKS CAN BE REDUCED AT THE DISCRETION OF THE LOCAL AUTHORITY FOR DESIGNS THAT USE UNDERDRAINS AND/OR LINERS.
13. INFORMED OWNER – THE PROPERTY OWNER SHOULD CLEARLY UNDERSTAND THE UNIQUE MAINTENANCE RESPONSIBILITIES INHERENT WITH PERMEABLE PAVEMENT, PARTICULARLY FOR PARKING LOT APPLICATIONS. THE OWNER SHOULD BE CAPABLE OF PERFORMING ROUTINE AND LONG-TERM ACTIONS (E.G. VACUUMING) TO MAINTAIN THE PAVEMENT'S HYDROLOGIC FUNCTIONS, AND AVOID FUTURE PRACTICES (E.G., WINTER SANDING, SEAL COATING OR REPAVING) THAT DIMINISH OR ELIMINATE THEM. FOR POROUS ASPHALT A DILUTED EMULSION FOG CAN BE USED AS NEEDED. MAINTENANCE AGREEMENTS, COVENANTS, MAINTENANCE EASEMENTS FOR PERFORMANCE BONDS ARE ENCOURAGED BETWEEN THE LOCAL AUTHORITY AND THE PROPERTY OWNER.
14. PERMEABLE PAVEMENTS SHOULD NOT BE USED IN HIGH POLLUTANT LOADING SITES. HIGH POLLUTANT LOADING SITES ARE THOSE THAT RECEIVE CONSTANT SEDIMENT OR TRASH AND/OR DEBRIS. PLACES WHERE FUELS AND CHEMICALS ARE STORED OR HANDLED CAN BE POTENTIAL STORMWATER HOTSPOTS AND PERMEABLE PAVEMENT SHOULD NOT BE CONSTRUCTED IN THESE PLACES. LIKEWISE, AREAS SUBJECT TO WIND BORNE DUST AND SEDIMENT SHOULD NOT USE PERMEABLE PAVEMENT UNLESS THE PAVEMENT CAN BE VACUUMED REGULARLY. THE FOLLOWING LIMITATIONS SHOULD BE CONSIDERED BEFORE UTILIZING PERMEABLE PAVEMENTS IN ANY DESIGN.
15. PERMEABLE PAVEMENT IS SUITABLE FOR PEDESTRIAN-ONLY AREAS, LOW-VOLUME ROADS, LOW SPEED AREAS, OVERFLOW PARKING AREAS, RESIDENTIAL DRIVEWAYS, ALLEYS, AND PARKING STALLS. THESE CAN BE RESIDENTIAL COLLECTOR ROADS OR OTHER APPLICATIONS WITH SIMILAR TRAFFIC LOADS.
16. PERMEABLE PAVEMENT CAN BE PRONE TO CLOGGING FROM SAND AND FINE SEDIMENTS THAT FILL VOID SPACES AND THE JOINTS BETWEEN PAVERS. AS A RESULT, IT SHOULD BE USED CAREFULLY WHERE FREQUENT WINTER SANDING IS NECESSARY BECAUSE THE SAND MAY CLOG THE SURFACE OF THE MATERIAL. PERIODIC MAINTENANCE IS CRITICAL, AND SURFACES SHOULD BE CLEANED WITH A VACUUM SWEEPER AT LEAST TWO TIMES A YEAR.
17. FUEL MAY LEAK FROM VEHICLES AND TOXIC CHEMICALS MAY LEACH FROM ASPHALT AND/OR BINDER SURFACE. POROUS PAVEMENT SYSTEMS ARE NOT DESIGNED TO TREAT THESE POLLUTANTS.

STRUCTURAL DESIGN:

1. PERMEABLE INTERLOCKING PAVEMENTS (SMITH 2011) USE FLEXIBLE PAVEMENT DESIGN METHODS ADAPTED FROM THE 1993 AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES (AASHTO 1993) THERE HAS BEEN LIMITED RESEARCH ON FULL-SCALE TESTING OF THE STRUCTURAL BEHAVIOR OF OPEN-GRADED BASES USED UNDER PERMEABLE PAVEMENTS TO BETTER CHARACTERIZING RELATIONSHIPS BETWEEN LOADS AND DEFORMATION. THEREFORE CONSERVATIVE VALUES (I.E. AASHTO LAYER COEFFICIENTS) SHOULD BE ASSUMED FOR OPEN-GRADED BASE AND SUBBASE AGGREGATES IN PERMEABLE PAVEMENT DESIGN.
2. STRUCTURAL DESIGN METHODS CONSIDER THE FOLLOWING IN DETERMINING SURFACE AND BASE THICKNESS TO SUPPORT VEHICULAR TRAFFIC

- 1.1. PAVEMENT LIFE AND TOTAL ANTICIPATED TRAFFIC LOADS EXPRESSED AS 18,000 POUNDS EQUIVALENT SINGLE AXLE LOADS OR ESALS (THIS METHOD AS ASSESSING LOADS ACCOUNT FOR THE ADDITIONAL PAVEMENT WEAR CAUSED BY TRUCKS)
- 1.2. SOIL STRENGTH EXPRESSED AS THE SOAKED CBR BEARING RATIO (CBR), R-VALUE OR RESILIENT MODULUS(MR)
- 1.3. STRENGTH OF THE SURFAACING, BASE AND SUBBASE MATERIALS
- 1.4. ENVIRONMENTAL FACTORS INCLUDING FREEZING CLIMATES AND EXTENDED SATURATION OF THE SOIL SUBGRADE.
2. STRUCTURAL DESIGN FOR VEHICULAR APPLICATIONS SHOULD GENERALLY BE ON SOIL SUBGRADES WITH A CBR (96-HOUR SOAKED PER ASTM D1883 OR AASHTO T 193) OF 4 PERCENT, OR A MINIMUM R-VALUE = 9 PER ASTM D 2488 OR AASHTO T-190, OR A MINIMUM MR OF 6,500 POUNDS PER SQUARE INCH (45 MEGA PASCALS) PER AASHTO T-307. SOILS WITH LOWER STRENGTHS TYPICALLY REQUIRE THICKENED PERMEABLE BASES OR THOSE USING CEMENT OR ASPHALT STABILIZED OPEN-GRADED AGGREGATES.
3. SOIL COMPACTION REQUIRED TO ACHIEVE THESE SOIL STRENGTHS WILL REDUCE THE INFILTRATION RATE OF THE SOIL. THEREFORE, THE PERMEABILITY OR INFILTRATION RATE OF SOIL SHOULD BE ASSESSED AT THE DENSITY REQUIRED TO ACHIEVE ONE OF THESE VALUES. IF SOILS UNDER VEHICULAR TRAFFIC HAVE LOWER STRENGTHS THAN THOSE NOTED ABOVE, OR ARE EXPANSIVE WHEN WET, THERE ARE SEVERAL OPTIONS INCLUDING:
 - 3.1. UNDERDRAINS
 - 3.2. THICKENED BASE/SUBBASE LAYER(S)
 - 3.3. CEMENT OR ASPHALT STABILIZED BASE LAYER
 - 3.4. LIME OR CEMENT STABILIZED (WITH DESIGN CONSIDERATION GIVEN TO PRACTICALLY NO INFILTRATION IN SUCH CASES).

THESE OPTIONS ARE TYPICALLY USED IN COMBINATION. PEDESTRIAN APPLICATIONS CAN BE PLACED ON LOWER STRENGTH SOILS THAN THOSE NOTED.

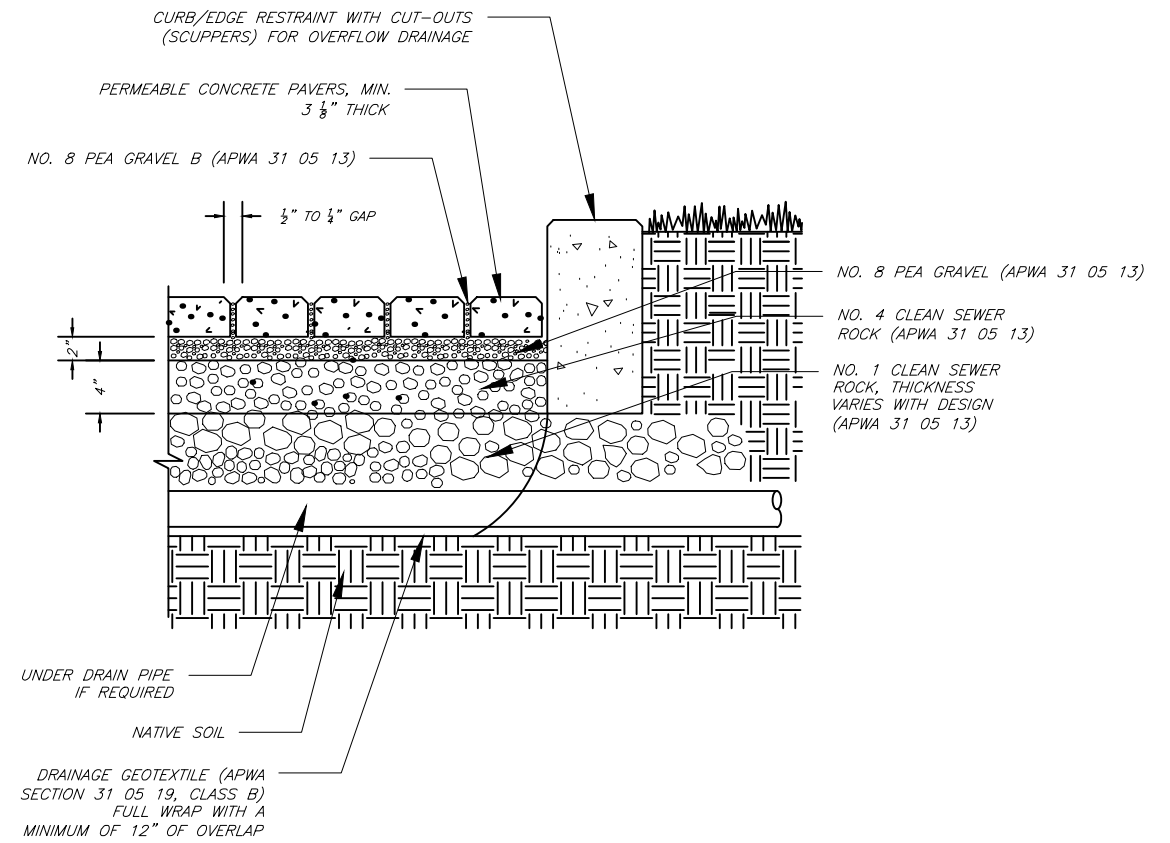
DESIGN FOR NUTRIENT AND TSS REDUCTIONS:

PERMEABLE PAVEMENTS CAN BE DESIGNED TO REDUCE NUTRIENT LOADINGS TO THE GROUND OF SURFACE WATERS. THE DESIGN NEEDS TO BE SPECIFICALLY DESIGNED TO CAPTURE PHOSPHORUS. THE PERMEABLE PAVEMENT SYSTEM CAN ALSO BE DESIGNED TO CAPTURE NITROGEN, ALTHOUGH IT IS IMPORTANT TO NOTE THAT NITROGEN AND PHOSPHORUS EACH REQUIRE SPECIFIC DESIGNS TO FACILITATE THEIR REMOVAL FROM STORMWATER. THE FOLLOWING PARAGRAPHS DESCRIBE THE DESIGN CHARACTERISTICS NECESSARY FOR THE REMOVAL OF PHOSPHORUS AND NITROGEN.

A STUDY BY (BEAN2007A) SHOWED HIGHER NITRATE CONCENTRATIONS IN THE EXFILTRATE COMPARED TO THE INFILTRATE. NITROGEN REDUCTION CAPABILITIES OF PERMEABLE PAVEMENT CAN BE ENHANCED IN PARTIAL INFILTRATION DESIGNS TO DETAIN WATER IN THE BASE/SUBBASE FOR OVER 24 HOURS. THIS TIME IS REQUIRED TO ENSURE COMPLETE DE-NITRIFICATION OCCURS.

PERMEABLE PAVERS CAN USE SPECIALLY COATED AGGREGATES IN THE JOINTS AND BEDDING AND ALL SYSTEMS CAN USE THEM IN THE BASE TO REDUCE PHOSPHORUS. COATED AGGREGATES (SOMETIMES CALLED "ENGINEERED AGGREGATES") HAVE AN EFFECTIVE LIFE OF SEVEN TO TEN YEARS AND TARGET THE REMOVAL OF DISSOLVED PHOSPHORUS, ACCORDING TO MANUFACTURERS LITERATURE.

A FILTER LAYER MADE OF SAND OR FINE AGGREGATE PLACED UNDER OR SANDWICHED WITHIN PERMEABLE PAVEMENT BASES ARE OCCASIONALLY USED AS A MEANS TO REDUCE NUTRIENTS. THIS LAYER CAN BE ENHANCED WITH IRON FILING FOR PHOSPHOROUS REDUCTION (ERICKSON 2010). THEIR EFFECTIVENESS, INITIAL COST, REDUCTION IN FLOW RATES, AND MAINTENANCE COST SHOULD BE WEIGHED AGAINST OTHER DESIGN OPTIONS FOR NUTRIENT REDUCTIONS. SAND FILTERS WILL INCUR ADDITIONAL CONSTRUCTION EXPENSE AND THIS CAN BE REDUCED BY PLACING SAND FILTERS UNDER THE SUBBASE AT THE DOWN SLOPE END OF A PERMEABLE PAVEMENT. THE DISADVANTAGE OF SAND FILTERS IS THAT THEY WILL EVENTUALLY REQUIRE REMOVAL AND RESTORATION IF CONTINUED PHOSPHOROUS REDUCTION CREDIT IS DESIRED. CONCENTRATING THEIR LOCATION IN THE DOWN SLOPE AREAS OF THE SITE CAN HELP REDUCE FUTURE MAINTENANCE COSTS AND SITE DISRUPTIONS. A SECOND APPROACH USEFUL FOR NUTRIENT AND TSS REDUCTION CAN OCCUR ON SLOPING SITES BY CREATING INTERMITTENT BERMS IN THE SOIL SUBGRADE. THESE ENABLE SETTLEMENT OF SUSPENDED SOLIDS AND ENCOURAGE DE-NITRIFICATION IF APPROPRIATELY DESIGNED. A THIRD ALTERNATIVE IS USING A "TREATMENT TRAIN" APPROACH WHERE A PERMEABLE PAVEMENT INITIALLY FILTERS RUNOFF AND THE REMAINING WATER OUTFLOWS TO BIOSWALES OR RAIN GARDENS ADJACENT TO THE PAVEMENT FOR ADDITIONAL PROCESSING AND NUTRIENT REDUCTION. THERE MAY BE BMPs USED TO REMOVE NUTRIENTS AS THE WATER MOVES THROUGH THE WATERSHED.



MAINTENANCE:

1. OBSERVATION WELL – TYPICALLY THIS CONSISTS OF WELL-ANCHORED, SIX-INCH DIAMETER PERFORATED PVC PIPE THAT EXTENDS VERTICALLY TO THE BOTTOM OF THE RESERVOIR LAYER. THIS IS INSTALLED AT THE DOWN SLOPE END OF THE PERMEABLE PAVEMENT. THE OBSERVATION WELL SHOULD BE FITTED WITH A LOCKABLE CAP INSTALLED FLUSH WITH GROUND SURFACE (OR UNDER THE PAVERS) TO FACILITATE PERIODIC INSPECTION AND MAINTENANCE. THE OBSERVATION WELL ENABLES VISUAL MONITORING OF DRAINDOWN WITHIN THE RESERVOIR LAYER AFTER A STORM.
2. OVERHEAD LANDSCAPING – SOME COMMUNITIES REQUIRE A CERTAIN PERCENTAGE OF PARKING LOTS TO BE LANDSCAPED. LARGE-SCALE PERMEABLE PAVEMENT SHOULD BE CAREFULLY PLANNED TO INTEGRATE LANDSCAPING IN A MANNER THAT MAXIMIZES RUNOFF TREATMENT AND MINIMIZES RISK OF SEDIMENT, MULCH, GRASS CLIPPINGS, CRUSHED LEAVES, NUTS, AND FRUITS INADVERTENTLY CLOGGING THE SURFACE. PRIOR TO CONSTRUCTION, OWNERS SHOULD COMMIT TO A VACUUMING PLAN THAT INCLUDES VACUUMING FREQUENCY AND EQUIPMENT NEEDS. THE VACUUMING FREQUENCY DEPENDS ON THE TIME OF YEAR. IN THE SPRING, TREE BUDS AND SEEDS NECESSITATE FREQUENT VACUUMING. IN THE FALL, TREE LEAVES AND ACORNS NECESSITATE FREQUENT VACUUMING. IN THE SUMMER, VACUUMING FREQUENCY DEPENDS ON PERMEABLE PAVEMENT EXPOSURE TO ORGANIC MATERIAL FROM TREES AND NEARBY VEGETATED AREAS. VACUUMING EQUIPMENT AND METHODS FOR SEDIMENT REMOVAL ARE PROVIDED IN THE SECTION ADDRESSING OPERATION AND MAINTENANCE.

WINTER CONSIDERATIONS:

PLOWED SNOW PILES SHOULD BE LOCATED IN ADJACENT GRASSY AREAS SO THE SEDIMENTS AND POLLUTANTS IN SNOWMELT ARE PARTIALLY TREATED BEFORE THEY REACH ALL PERMEABLE PAVEMENTS. SAND AND SALT ARE NOT RECOMMENDED FOR WINTER TRACTION OVER PERMEABLE PAVEMENTS. A SIGNIFICANT WINTER ADVANTAGE OF PERMEABLE PAVEMENTS IS THAT THEY REQUIRE LESS DEICING MATERIALS THAN THEIR IMPERVIOUS COUNTERPARTS. USE OF DEICING MATERIAL ON PERMEABLE PAVEMENTS IS THEREFORE NOT RECOMMENDED.

SIGNAGE:

PERMEABLE PAVEMENTS CAN BE USED AS OPPORTUNITIES FOR PUBLIC EDUCATION WITH SIGNS EXPLAINING HOW THEY WORK. INFILTRATION DEMONSTRATIONS ALSO HELP SHOW HOW THE PAVEMENTS WORK. SIGNS PROVIDE A REMINDER TO MAINTENANCE CREWS OF THEIR PRESENCE AND LIST MAINTENANCE DO'S AND DON'T'S SPECIFIC TO THE PERMEABLE PAVEMENT TYPE.

7.

PROJECT NO.
M. CHANDLER

DESIGNED BY
A. THOMPSON

CHECKED BY
A. THOMPSON

DRAWN BY
O. CURTIS

DRAWING SCALE
N.T.S.

ISSUE DATE
8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
PERMEABLE PAVEMENT AND PAVERS

PROJECT NUMBER 2020-0125	SHEET 46 OF 58
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LID- Page 61	

STORM WATER – LOW IMPACT DEVELOPMENT (LID) RECOMMENDED PRACTICES AND DETAILS PERMEABLE PAVEMENT AND PAVERS

BRIEF DESCRIPTION:

PERMEABLE PAVEMENTS ALLOW STORMWATER RUNOFF TO FILTER THROUGH SURFACE VOIDS INTO AN UNDERLYING STONE RESERVOIR FOR TEMPORARY STORAGE AND/OR INFILTRATION. THE MOST COMMONLY USED PERMEABLE PAVEMENT SURFACES ARE PERVIOUS CONCRETE, POROUS ASPHALT, AND PERMEABLE INTERLOCKING CONCRETE PAVERS (PICP). PERMEABLE PAVEMENTS HAVE BEEN USED FOR AREAS WITH LIGHT TRAFFIC AT COMMERCIAL AND RESIDENTIAL SITES TO REPLACE TRADITIONAL IMPERVIOUS SURFACES IN LOW-SPEED ROADS, ALLEYS, PARKING LOTS, DRIVEWAYS, SIDEWALKS, PLAZAS, AND PATIOS. WHILE DESIGN DETAILS VARY, ALL PERMEABLE PAVEMENTS HAVE A SIMILAR STRUCTURE, CONSISTING OF A SURFACE PAVEMENT LAYER, AN UNDERLYING STONE AGGREGATE RESERVOIR LAYER, OPTIONAL UNDERDRAINS AND GEOTEXTILE OVER UNCOMPACTED SOIL SUBGRADE.

COST RANGE:

- CONSTRUCTION: \$\$-\$\$\$
- O&M: \$\$

IDEAL CONDITIONS FOR INSTALLATION:

- PRECIPITATION: SUITABLE FOR MOST STORM EVENTS
- SOILS: WORKS WELL IN TYPE A, B SOILS WITH NO UNDERDRAIN; CAN WORK IN TYPE C, D SOILS WITH AN UNDERDRAIN SYSTEM
- GROUNDWATER: 3' SEPARATION FROM BOTTOM OF PERMEABLE PAVEMENT RESERVOIR TO SEASONAL HIGH WATER TABLE.

WHERE/APPLICABILITY:

- RESIDENTIAL: YES
- COMMERCIAL: YES
- ULTRA URBAN: YES
- INDUSTRIAL: LIMITED TO AREAS WITH LOW TO MODERATE POLLUTANT LOADING POTENTIAL
- HIGHWAY/ROAD: YES, IN NON-TRAVEL LANE AREAS
- RETROFIT: YES, BUT TYPICALLY REQUIRES TOTAL REPLACEMENT OF SURFACE IMPROVEMENTS WHEN USED
- FEASIBLE: DO NOT USE WHEN THE WATER TABLE IS LESS THAN 4' DEEP; DO NOT USE OVER IMPERVIOUS SOIL.

MAINTENANCE:

- FREQUENCY: YEARLY
- TYPE: MOW, TRIM, SEDIMENT REMOVAL
- MONITORING: NO
- PERMIT RENEWAL: NO



PERFORMANCE:

- TOTAL SUSPENDED SOLIDS (TSS): HIGH
- CHLORIDE: MEDIUM
- TOTAL NITROGEN: HIGH IN SOLID FORM; MEDIUM IN DISSOLVED FORM
- METALS: HIGH
- OILS AND GREASE: HIGH
- PATHOGENS: MEDIUM
- PHOSPHORUS: HIGH

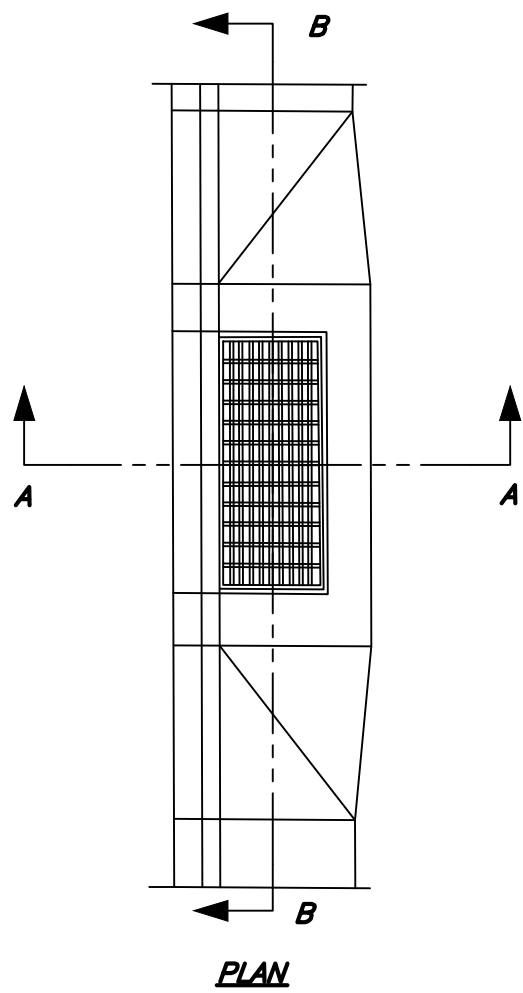
NO.	DESCRIPTION	DATE

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	8/31/2022

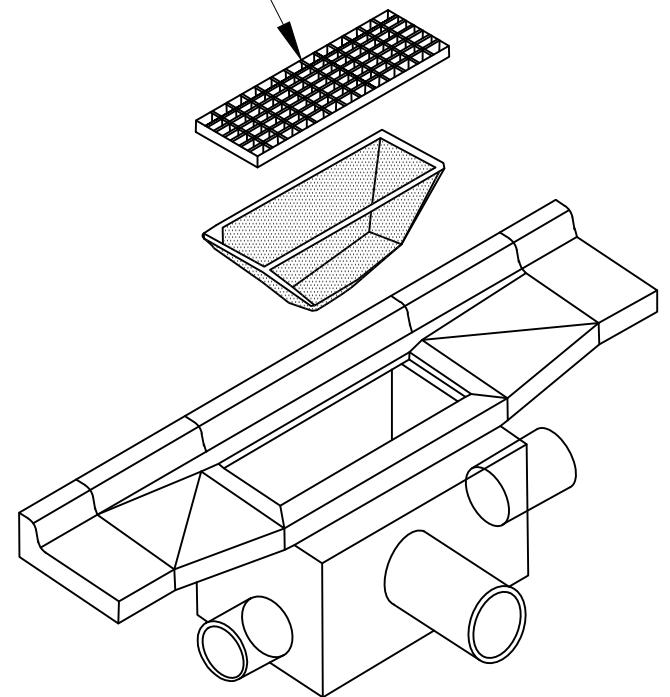
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PUBLIC WORKS STANDARDS
PERMEABLE PAVERS

PROJECT NUMBER	2020-0125		
SHEET	47	OF	58
SHEET NUMBER	LID-0		



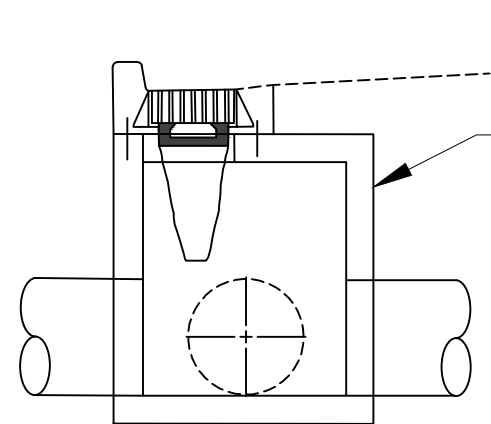
USE ONLY BICYCLE SAFE GRATE AND FRAME PER SD-05



DROP-DOWN INLET PROTECTION

NOTES:

1. INSTALL AT INLETS DOWNGRADIENT OF AREAS DISTURBED BY CONSTRUCTION ACTIVITIES. PROVIDE PROTECTION FOR BOTH SIDES OF STREET.
2. USE ONLY DROP-DOWN BAG STYLE INLET PROTECTION (MINIMUM 12" BAG DEPTH)
3. DO NOT USE SAND/GRAVEL BAGS OR GRADE WRAP STYLE INLET PROTECTIONS.
4. USE ONLY INLET PROTECTION THAT IS MADE OF A MATERIAL THAT WILL ALLOW WATER TO PASS THROUGH WHILE FILTERING OUT COARSE AND FINE SEDIMENT AT 99% REMOVAL RATE FILTER. FILTER BAG MATERIAL MUST BE ABLE TO PASS A MINIMUM OF 20 GALLONS PER MINUTE.
5. PROVIDE MAINTENANCE PER MANUFACTURER'S RECOMMENDATIONS.



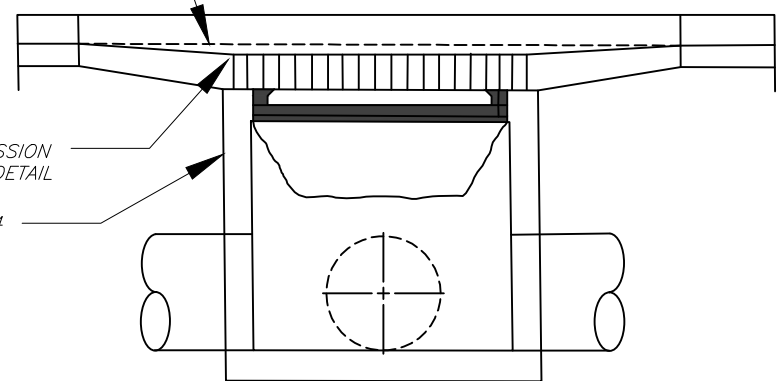
SECTION A-A

BOX PER DETAIL SD-03 OR SD-04

2" MAX DEPRESSION
SEE CURB DEPRESSION DETAIL

BOX PER DETAIL SD-03 OR SD-04

NORMAL GUTTER ELEVATION



SECTION B-B

RECORD OF REVISIONS	
NO.	DESCRIPTION
7.	

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
PERMANENT INLET FILTRATION DEVICES

PROJECT NUMBER 2020-0125	
SHEET 48	OF 58
SHEET NUMBER LID-	

STORM WATER – LOW IMPACT DEVELOPMENT (LID) RECOMMENDED PRACTICES AND DETAILS POST-CONSTRUCTION INLET PROTECTION/FILTERS

BRIEF DESCRIPTION:

THE POST-CONSTRUCTION INLET PROTECTION BMP/FILTER PROVIDES A PERMANENT METHOD OF REMOVAL OF SOME POLLUTANTS FOR ANY STORM DRAIN INLET. THIS SYSTEM WILL CAPTURE AND COLLECT SOME POLLUTANTS, ACCORDING TO THE FILTER DESIGN, BEFORE THEY ENTER THE STORMWATER CONVEYANCE SYSTEM.

COST RANGE:

- CONSTRUCTION: \$\$
- O&M: \$\$

IDEAL CONDITIONS FOR INSTALLATION:

- PRECIPITATION: ALL
- SOILS: N/A
- GROUNDWATER: N/A

WHERE/APPLICABILITY:

- RESIDENTIAL: YES
- COMMERCIAL: YES
- ULTRA URBAN: YES
- INDUSTRIAL: YES
- HIGHWAY/ROAD: YES
- RETROFIT: YES
- FEASIBLE: MOST INLETS

MAINTENANCE:

- FREQUENCY: QUARTERLY OR DEPENDING ON THE STORMWATER POLLUTANT TYPE AND LOADING
- TYPE: VACUUMING, EMPTYING OR REPLACEMENT
- MONITORING: QUARTERLY INSPECTIONS OR AS NEEDED
- PERMIT RENEWAL: N/A



PERFORMANCE:

- TOTAL SUSPENDED SOLIDS (TSS): HIGH
- CHLORIDE: LOW
- TOTAL NITROGEN: MEDIUM
- OILS AND GREASE: HIGH
- PATHOGENS: LOW

NO.	DESCRIPTION	DATE

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
POST-CONSTRUCTION INLET PROTECTION/FILTERS

PROJECT NUMBER	2020-0125	
SHEET	49	OF 58
SHEET NUMBER	LID-0	

STORM WATER – LOW IMPACT DEVELOPMENT (LID) RECOMMENDED PRACTICES AND DETAILS HYDRODYNAMIC SEPARATORS

BRIEF DESCRIPTION:

THE HYDRODYNAMIC SEPARATOR (HDS) IS A BEST MANAGEMENT PRACTICE (BMP) THAT USES THE ENERGY OF THE STORMWATER AND THE SHAPE OF THE STRUCTURE TO SEPARATE SOME POLLUTANTS FROM THE WATER. HYDRODYNAMIC DEVICES OFTEN ENHANCE THE RATE OF SEDIMENT ALONG WITH THE CAPTURE OF OIL, GREASE, AND OTHER FLOATABLES. HYDRODYNAMIC DEVICES ARE TYPICALLY DESIGNED TO PROVIDE OPTIMAL REMOVAL EFFICIENCY FOR SMALLER, MORE FREQUENT STORMS WITH MINIMAL REMOVAL IN LARGER, LESS COMMON STORMS.

COST RANGE:

- CONSTRUCTION: \$\$\$
- O&M: \$\$

IDEAL CONDITIONS FOR INSTALLATION:

- PRECIPITATION: SMALLER, MORE FREQUENT STORMS
- SOILS: N/A
- GROUNDWATER: DEPENDS ON MANUFACTURER

WHERE/APPLICABILITY:

- RESIDENTIAL: YES
- COMMERCIAL: YES
- ULTRA URBAN: YES
- INDUSTRIAL: YES
- HIGHWAY/ROAD: YES
- RETROFIT: YES

THE SYSTEM CAN BE PLACED AT THE POINT SOURCE BEFORE THE STORM WATER ENTERS THE STORM DRAIN SYSTEM OR BEFORE IT OUTLETS INTO A DIFFERENT SYSTEM.

MAINTENANCE:

- FREQUENCY: QUARTERLY-YEARLY
- TYPE: SEDIMENT AND FLOATABLE REMOVAL
- MONITORING: REVIEW OF AMOUNT OF SEDIMENT COLLECTED
- PERMIT RENEWAL: NO

PERFORMANCE:

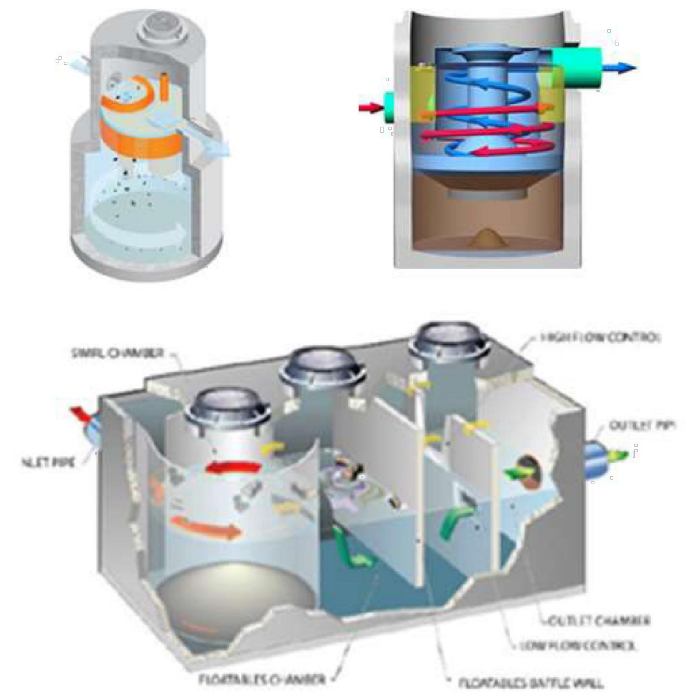
- TOTAL SUSPENDED SOLIDS (TSS): MEDIUM
- CHLORIDE: N/A
- TOTAL NITROGEN: N/A
- OILS AND GREASE: MEDIUM
- METALS: MEDIUM
- PATHOGENS: LOW

SPECIFICATIONS:

1. THE SEPARATOR SHALL BE SIZED TO EITHER ACHIEVE AN 80 PERCENT AVERAGE ANNUAL REDUCTION IN THE TOTAL SUSPENDED SOLID LOAD OR TREAT A FLOW RATE DESIGNATED BY THE JURISDICTION IN WHICH THE PROJECT IS LOCATED. BOTH METHODS SHOULD BE SIZED USING A PARTICLE SIZE DISTRIBUTION HAVING A MEAN PARTICLE SIZE (D50) OF 125 MICRONS UNLESS OTHERWISE STATED.
2. THE SEPARATOR SHALL BE CAPABLE OF CAPTURING AND RETAINING 100 PERCENT OF POLLUTANTS GREATER THAN OR EQUAL TO 2.4 MILLIMETERS (MM) REGARDLESS OF THE POLLUTANT'S SPECIFIC GRAVITY FOR FLOWS UP TO THE DEVICE'S RATED-TREATMENT CAPACITY.
3. THE SEPARATOR SHALL BE DESIGNED TO RETAIN ALL PREVIOUSLY CAPTURED POLLUTANTS ADDRESSED BY THIS SUBSECTION UNDER ALL FLOW CONDITIONS. THE SEPARATOR SHALL BE CAPABLE OF CAPTURING AND RETAINING TOTAL PETROLEUM HYDROCARBONS.
4. THE SEPARATOR SHALL BE CAPABLE OF ACHIEVING A REMOVAL EFFICIENCY OF 92 AND 78 PERCENT WHEN THE DEVICE IS OPERATING AT 25 AND 50 PERCENT OF ITS RATED-TREATMENT CAPACITY. THESE REMOVAL EFFICIENCIES SHALL BE BASED ON INDEPENDENT THIRD-PARTY RESEARCH FOR INFLUENT OIL CONCENTRATIONS REPRESENTATIVE OF STORM WATER RUNOFF (20 ± 5 MG/L).
5. THE SEPARATOR SHALL BE GREATER THAN 99 PERCENT EFFECTIVE IN CONTROLLING DRY-WEATHER ACCIDENTAL OIL SPILLS.
6. IN ORDER TO NOT RESTRICT THE OWNER'S ABILITY TO MAINTAIN THE SEPARATOR, THE MINIMUM DIMENSION PROVIDING ACCESS FROM THE GROUND SURFACE TO THE SUMP CHAMBER IS RECOMMENDED TO BE 16 INCHES IN DIAMETER.
7. THE SEPARATOR SHALL BE DESIGNED TO CAPTURE AND RETAIN TOTAL PETROLEUM HYDROCARBONS GENERATED BY WET-WEATHER FLOW AND DRY-WEATHER GROSS SPILLS.
8. THE SEPARATOR SHALL CONVEY THE FLOW FROM THE PEAK STORM EVENT OF THE DRAINAGE NETWORK, IN ACCORDANCE WITH REQUIRED HYDRAULIC UPSTREAM CONDITIONS AS DEFINED BY THE ENGINEER.
9. THE SEPARATOR SHALL HAVE COMPLETED FIELD TESTED FOLLOWING TARP TIER II PROTOCOL REQUIREMENTS.

CONSTRUCTION SEQUENCE:

1. TYPICAL SYSTEMS, COMPRISING OF BURIED STRUCTURES (MANHOLES, VAULTS, ETC.), ARE INSTALLED AS PART OF THE STORM WATER TREATMENT SYSTEM.
2. THE CONNECTING PIPES ENTERING AND LEAVING THE UNITS NORMALLY REQUIRE WATERTIGHT CONNECTIONS. FOLLOW MANUFACTURE RECOMMENDATIONS FOR THESE CONNECTIONS.
3. FOR ANY STRUCTURES BEING INSTALLED, THE LOADING CAPACITY SHOULD BE REVIEWED FOR PLACEMENT IN THE ROADWAY. THE REMAINING FILL MATERIAL MUST BE A CLASS I, II OR III BACKFILL AND SHOULD BE TAKEN TO AT LEAST 6" OVER THE CROWN OF THE SEPARATOR UNIT, BUT IN NO WAY LESS THAN THE SPECIFIED AMOUNT OF COVER PER THE MANUFACTURER SPECIFICATIONS OR THE ENGINEER REQUIREMENTS.
4. REFERENCE THE SITE PLAN TO DETERMINE THE LOCATION OF THE SEPARATOR UNIT SYSTEM. DETERMINE THE SEPARATOR CONFIGURATION, AND COMPARE IT TO THE CONFIGURATION SPECIFIED ON THE DETAIL SHEET. DETERMINE IF THE UNIT IS PROPERLY CONFIGURED TO ACCOMMODATE THE FLOW DIRECTION.
5. FOLLOW THE INSTALLATION INSTRUCTIONS AS PROVIDED BY THE SUPPLIER FOR CONNECTIONS, PARTS, ETC.
6. EXCAVATE TO PROPER DEPTH, LENGTH, AND WIDTH IN ACCORDANCE WITH REGULATIONS TO ENSURE SAFE SITE CONDITIONS.
7. LEVEL SUBGRADE TO THE PROPER ELEVATION AND CHECK AGAINST FINISHED GRADE AND STRUCTURE DIMENSIONS TO ENSURE ADEQUATE DEPTH.
8. GENERALLY THE UNIT SHOULD BE BACKFILLED WITH CLASS I, II, OR III MATERIAL TO THE DEPTH INDICATED ABOVE THE CROWN OF THE UNIT, OR AS SPECIFIED FOR TRAFFIC RATED SITUATIONS.
9. BACKFILL TO GRADE USING CLASS I, II OR III BACKFILL OR OTHER SUITABLE MATERIAL. COMPACT THE BACKFILL ACCORDING TO GEOTECHNICAL RECOMMENDATIONS.



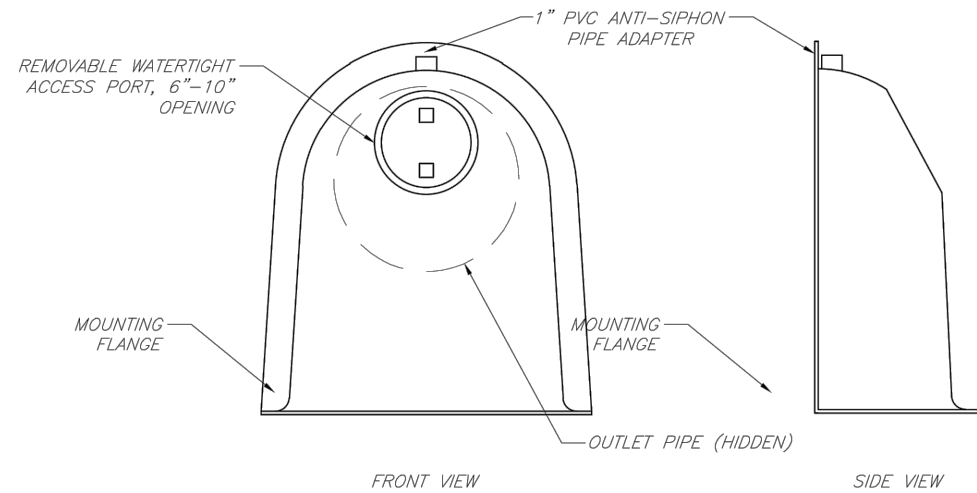
NO.	DATE	DESCRIPTION

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

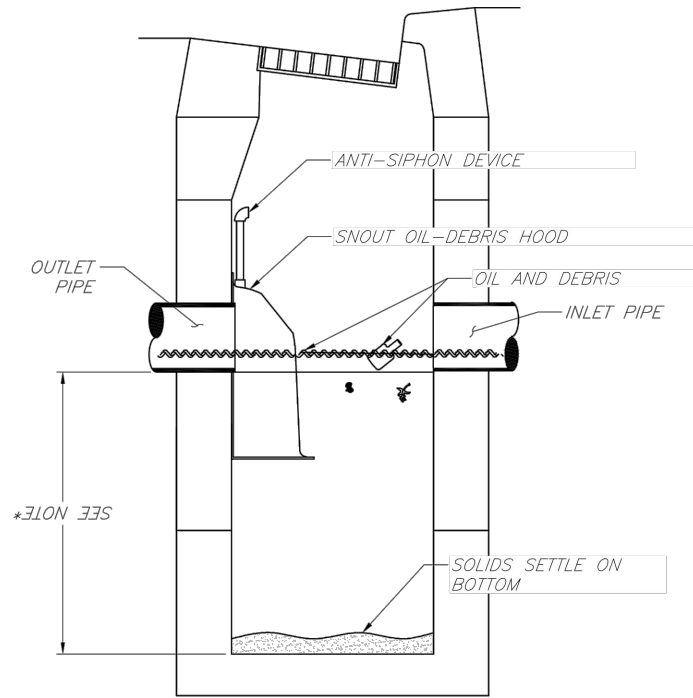
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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
HYDRODYNAMIC SEPARATORS

PROJECT NUMBER 2020-0125
SHEET 50 OF 58
SHEET NUMBER LID-0

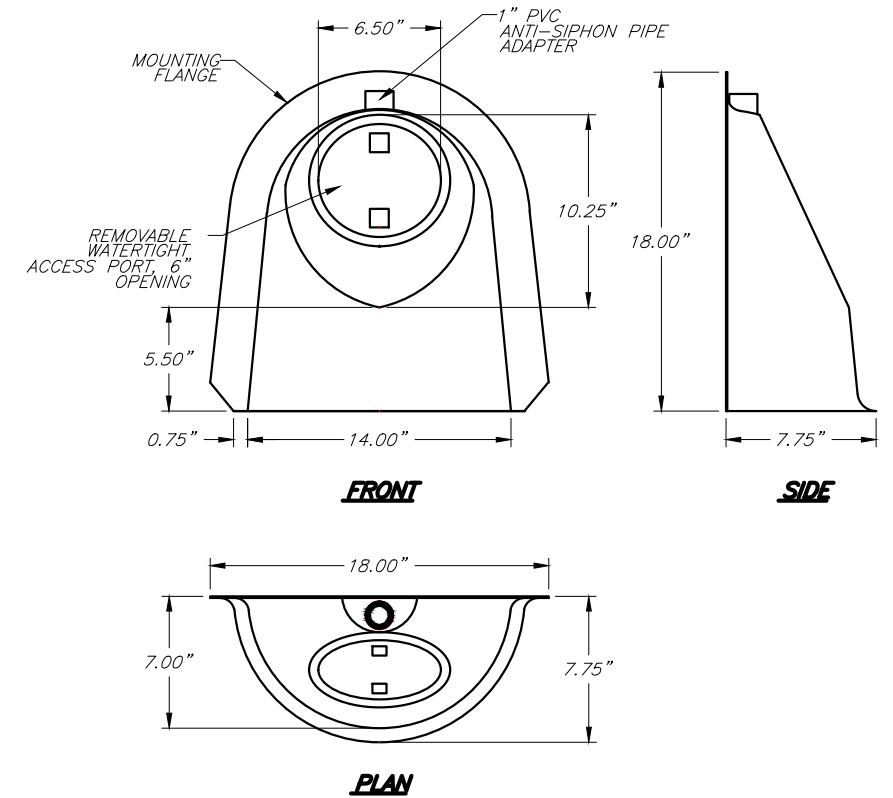


CONFIGURATION DETAIL

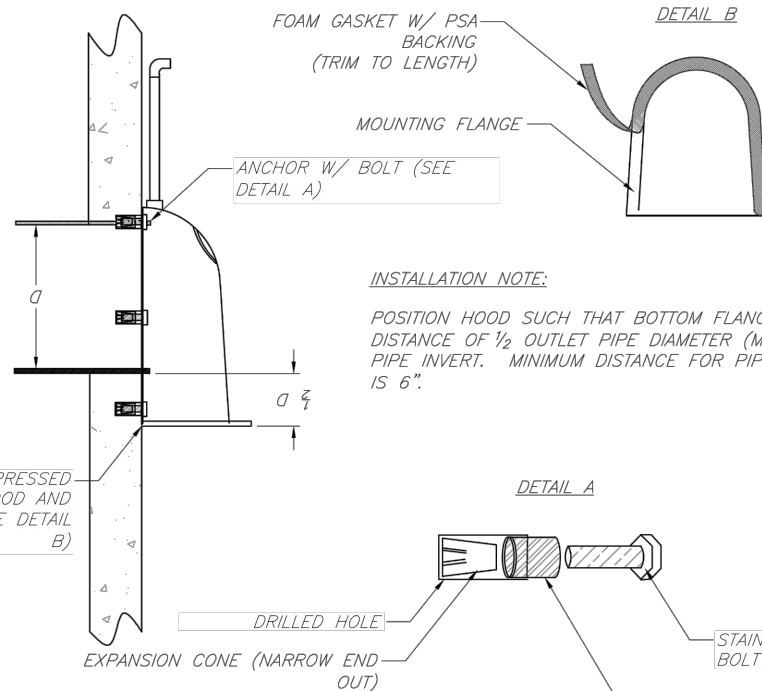


TYPICAL INSTALLATION

*NOTE- SUMP DEPTH OF 36" MIN. FOR UP TO 12" ID PIPE OUTLET. FOR PIPES 15" ID AND ABOVE SUMP DEPTH OF 2.5 TO 3 TIMES PIPE ID RECOMMENDED (E.G. 5' DEEP FOR 24" PIPE)



OUTLET SKIMMER ALTERNATE



INSTALLATION DETAIL

INSTALLATION NOTE:

POSITION HOOD SUCH THAT BOTTOM FLANGE IS A DISTANCE OF 1/2 OUTLET PIPE DIAMETER (MIN.) BELOW THE PIPE INVERT. MINIMUM DISTANCE FOR PIPES < 12" I.D. IS 6".

NO.	REVISIONS
7.	

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
OUTLET SKIMMERS

PROJECT NUMBER	2020-0125
SHEET	51 OF 58
SHEET NUMBER	LID-0

STORM WATER – LOW IMPACT DEVELOPMENT (LID) RECOMMENDED PRACTICES AND DETAILS OUTLET SKIMMERS

BRIEF DESCRIPTION:

A SKIMMER OR SHROUD IS TYPICALLY A HOODED DEVICE THAT IS INSTALLED OVER THE OUTLET PIPE IN A STORM DRAIN STRUCTURE WITH A DEEP SUMP THAT CAN HELP PREVENT FLOATABLES, SEDIMENTS, AND OTHER TRASH DEBRIS FROM ENTERING THE OUTLET PIPE.

COST RANGE:

- CONSTRUCTION: \$-\$\$
- O&M: \$\$

IDEAL CONDITIONS FOR INSTALLATION:

- PRECIPITATION: LOWER INTENSITY, MORE FREQUENT STORMS
- SOILS: N/A
- GROUNDWATER: LOWER THAN STORM DRAIN STRUCTURE AND INLET/OUTLET PIPES

WHERE/APPLICABILITY:

- RESIDENTIAL: YES
- COMMERCIAL: YES
- ULTRA URBAN: YES
- INDUSTRIAL: YES
- HIGHWAY/ROAD: YES
- RETROFIT: YES

MAINTENANCE:

- FREQUENCY: MONTHLY AND AFTER >0.5" STORM EVENTS
- TYPE: SEDIMENT, OILS AND TRASH REMOVAL
- MONITORING: INSPECT AMOUNTS OF MATERIAL COLLECTED
- PERMIT RENEWAL: N/A

PERFORMANCE:

- TOTAL SUSPENDED SOLIDS (TSS): LOW TO MEDIUM
- CHLORIDE: N/A
- TOTAL NITROGEN: N/A
- TOTAL PHOSPHORUS: N/A
- OILS AND GREASE: LOW (CAN BE HIGH WITH ADDITION OF FILTERS)
- METALS: LOW
- PATHOGENS: LOW
- FLOATABLES, TRASH, AND DEBRIS: HIGH

CONSTRUCTION SEQUENCE:

BELOW ARE GENERAL INSTALLATION INSTRUCTIONS. DETAILS MAY VARY DEPENDING ON THE TYPE, SIZE, SHAPE OF SNOUT AND STRUCTURE INCLUDING ACCESSORY INSTALLATIONS.

1. ENSURE STORM DRAIN STRUCTURE IS CLEANED AND PREPARED FOR SNOUT INSTALLATION.
2. TRIAL FIT THE SNOUT OVER THE OUTLET PIPE TO ENSURE PROPER SIZING PER SPECIFICATIONS.
3. DRILL HOES FOR ANCHOR SHIELDS.
4. PLACE GASKET ON THE SNOUT FLANGE AND BOLT SNOUT TO WALL WITH MANUFACTURERS HARDWARE.
5. ATTACH SIPHON AND ACCESSORIES (I.E. SCREENS, SKIRTS, DEFLECTORS) PER MANUFACTURER'S RECOMMENDATIONS.

PERFORMANCE:

BELOW ARE GENERAL SPECIFICATIONS THAT MAY VARY DEPENDING ON THE TYPE, SIZE, SHAPE AND MANUFACTURER OF SNOUT AND STRUCTURE. SNOUT MATERIALS MAY VARY DEPENDING ON MANUFACTURER.

1. ALL HOODS SHALL BE EQUIPPED WITH WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT PIPE AND ELBOW AS SHOWN ON MANUFACTURER'S DRAWING.
2. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATIONS (SNOUT SIZE SHALL BE LARGER THAN PIPE SIZE).
3. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A MINIMUM DISTANCE EQUAL TO 1/2 THE OUTLET PIPE DIAMETER WITH A MINIMUM DISTANCE OF 6" FOR PIPES <12" I.D.
4. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 12" ACCORDING TO STRUCTURE CONFIGURATION.
5. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL AND PIPE SHALL BE FINISHED FLUSH TO WALL.
6. ALL STRUCTURE JOINTS SHALL BE WATERTIGHT.
7. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8" STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER. INSTALL PER MANUFACTURER INSTRUCTIONS.
8. SUMP DEPTH SHALL BE 36" MINIMUM FOR UP TO 12" ID PIPE OUTLET. FOR PIPES 15" ID AND ABOVE, SUMP DEPTH OF 2.5 TO 3 TIMES PIPE I.D. RECOMMENDED.

NOTES:

1. ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
2. ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT PIPE AND ELBOW AS DRAWN. (SEE CONFIGURATION DETAIL)
3. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION (SNOUT SIZE ALWAYS LARGER THAN PIPE SIZE).
4. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A MINIMUM DISTANCE EQUAL TO 1/2 THE OUTLET PIPE DIAMETER WITH A MINIMUM DISTANCE OF 6" FOR PIPES <12" I.D.
5. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 12" ACCORDING TO STRUCTURE CONFIGURATION.
6. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL AND PIPE SHALL BE FINISHED FLUSH TO WALL.
7. ALL STRUCTURE JOINTS SHALL BE WATERTIGHT.
8. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8" STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER. (SEE INSTALLATION DETAIL)
9. INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT.

EXECUTION INSTALLATION KIT SHALL INCLUDE:

- A. INSTALLATION INSTRUCTIONS
- B. PVC ANTI-SIPHON VENT PIPE AND ADAPTER
- C. OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING
- D. 3/8" STAINLESS STEEL BOLTS
- E. ANCHOR SHIELDS

NO.	DESCRIPTION	DATE

PRINCIPAL	M. CHANDLER
PROJECT MANAGER	A. THOMPSON
CHECKED BY	A. THOMPSON
DRAWN BY	O. CURTIS
DRAWING SCALE	N.T.S.
ISSUE DATE	8/31/2022



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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
OUTLET SKIMMERS OR SHROUDS (PRE-TREATMENT)

PROJECT NUMBER	2020-0125
SHEET	52
OF	58
SHEET NUMBER	LID-0

STORM WATER – LOW IMPACT DEVELOPMENT (LID) RECOMMENDED PRACTICES AND DETAILS PARTICULATE FILTRATION SYSTEMS

BRIEF DESCRIPTION:

PARTICULATE FILTRATION DEVICES ALLOW STORMWATER TO PASS THROUGH FILTER MEDIA WHICH ARE DESIGNED TO REDUCE SPECIFIC STORMWATER POLLUTANTS, BUT PRIMARILY SOILS, NUTRIENTS, AND OILS. POLLUTANTS ARE CAPTURED PHYSICALLY OR THROUGH ADSORPTION ONTO THE FILTER MEDIA. FILTERS MAY BE INSERTS THAT ARE RETROFITTED INTO EXISTING CATCH BASINS OR MANHOLES, STAND ALONE PROPRIETARY UNITS SUPPLIED BY A MANUFACTURER, OR INDIVIDUALLY DESIGNED AND CONSTRUCTED UNITS. TYPICALLY SUITED FOR LOCATIONS WHERE INFILTRATION IS NOT AN OPTION.

COST RANGE:

- CONSTRUCTION: \$\$\$
- O&M: \$\$\$

IDEAL CONDITIONS FOR INSTALLATION:

- PRECIPITATION: TYPICALLY DESIGNED FOR 90% STORM OR STORMS UP TO 2 YEAR EVENT
- SOILS: SANDY, SILTY, OR CLAYEY SOILS
- GROUNDWATER: 1–3’ BELOW THE BOTTOM OF FILTER SYSTEM

WHERE/APPLICABILITY:

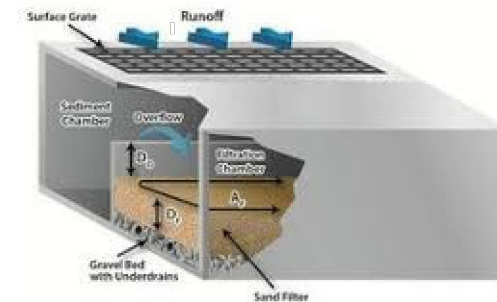
- RESIDENTIAL: YES
- COMMERCIAL: YES
- ULTRA URBAN: YES
- INDUSTRIAL: YES
- HIGHWAY/ROAD: YES
- RETROFIT: YES

MAINTENANCE:

- FREQUENCY: 4–5 YEARS WITH PRETREATMENT, ANNUALLY WITH NO PRETREATMENT
- TYPE: VAC TRUCK, FILTER MEDIA REPLACEMENT, JETTING, FILTER MEDIA BACK WASHING
- MONITORING: INSPECTED ANNUALLY
- PERMIT RENEWAL: VARIES BY PERMIT

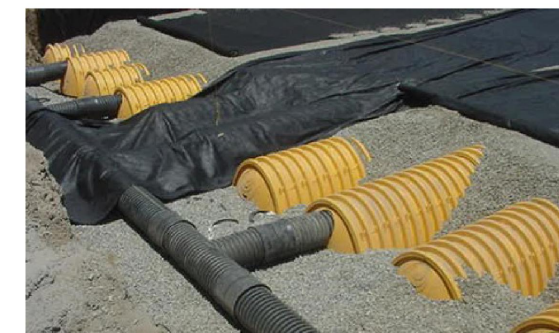
PERFORMANCE:

- TOTAL SUSPENDED SOLIDS (TSS): HIGH
- CHLORIDE: MEDIUM/HIGH DEPENDING ON MEDIA
- TOTAL NITROGEN: LOW/MEDIUM/HIGH DEPENDING ON MEDIA
- OILS AND GREASE: MEDIUM
- METALS: LOW/MEDIUM/HIGH DEPENDING ON MEDIA
- PATHOGENS: LOW/MEDIUM/HIGH DEPENDING ON MEDIA



Proprietary sample

Non-proprietary sample



SPECIFICATIONS:

1. PRETREATMENT IS RECOMMENDED TO REMOVE SEDIMENTS AND FLOATABLES.
2. FOLLOW THE MANUFACTURER RECOMMENDED REQUIREMENTS FOR INSTALLATION, OPERATION AND MAINTENANCE.
3. INCLUDE INSPECTION AND MAINTENANCE PORTS TO MAKE IT EASY TO INSPECT AND MAINTAIN THE FILTRATION DEVICE.
4. SELECT FILTER MATERIAL DESIGNED TO DRAIN WITHIN 24 HOURS.
5. FILTER CLOTH SHOULD BE WOVEN GEOTEXTILE WITH A HYDRAULIC FLOW RATE OF AT LEAST 100 GPM/FT².
6. LINER MATERIAL SHOULD BE A MINIMUM OF 20 ML POLY.
7. GRAVEL SHOULD BE CLEAN/WASHED WITH NO MORE THAN 5% FINES.
8. LIMESTONE AGGREGATE IS NOT ACCEPTABLE.

CONSTRUCTION SEQUENCE:

1. INSTALL PRETREATMENT DEVICE.
2. INSTALL LINER IF CONTAMINATED SOILS UNDERLYING THE SITE.
3. INSTALL MAIN STRUCTURE (IF PROPRIETARY) AND THEN FILTER MEDIA.
4. INSTALL INITIAL BASE COURSE OF GRAVEL OR FILTER MEDIA.
5. INSTALL PIPE NETWORK OF CHAMBERS AND INTERCONNECTING PIPES.
6. INSTALL REMAINING GRAVEL AND FILTER MEDIA.
7. COVER ENTIRE AREA WITH FILTER CLOTH.
8. INSTALL NECESSARY GROUND COVER (PAVEMENT, TOP SOIL AND SEED)

NO.	DESCRIPTION	DATE

PRINCIPAL M. CHANDLER
PROJECT MANAGER A. THOMPSON
CHECKED BY A. THOMPSON
DRAWN BY O. CURTIS
DRAWING SCALE N.T.S.
ISSUE DATE 8/31/2022

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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
PARTICULATE FILTRATION SYSTEMS

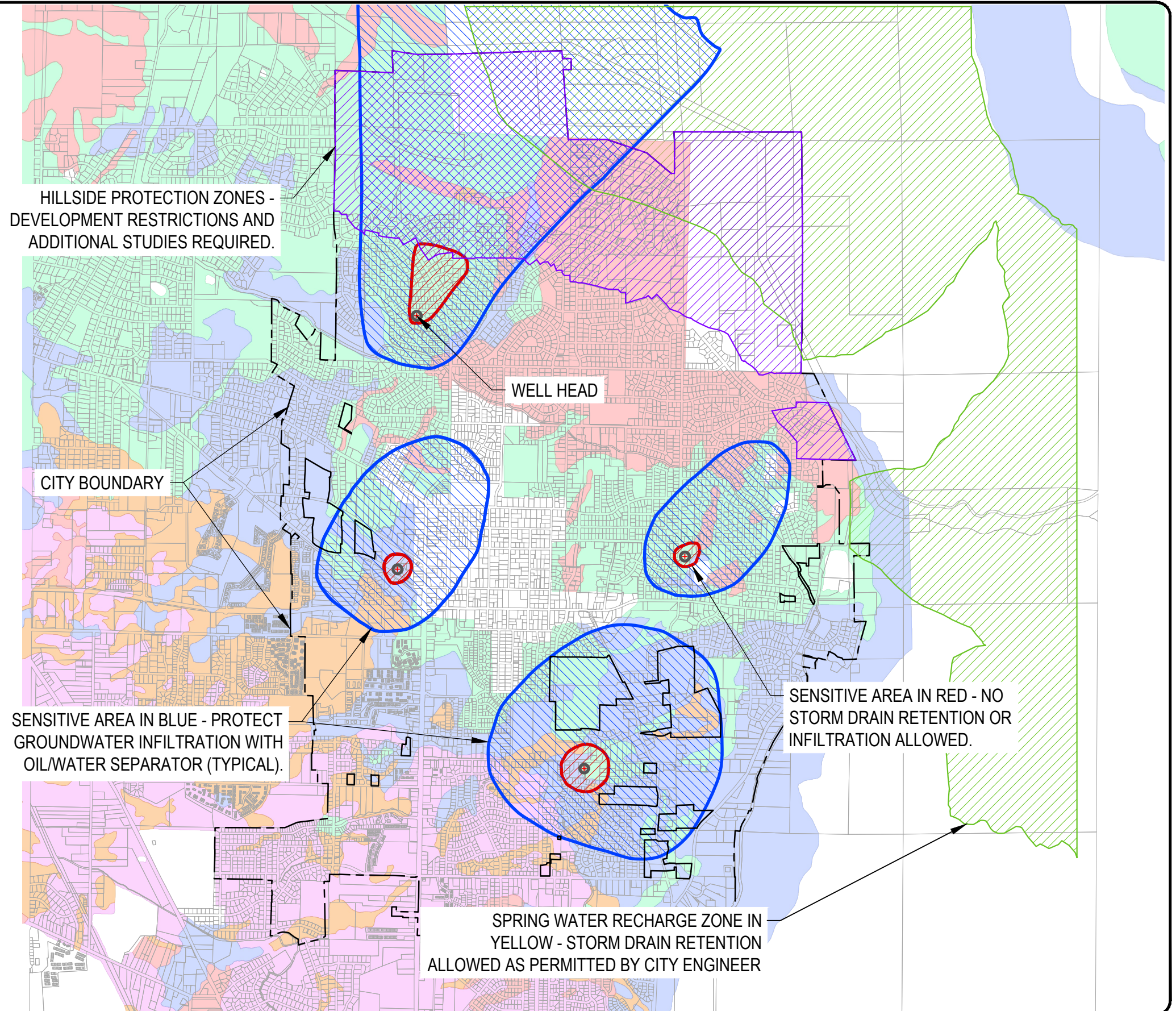
PROJECT NUMBER 2020-0125
SHEET 53 OF 58
SHEET NUMBER LID- Page 68

SENSITIVE AND PROTECTED AREA NOTES:

1. NEW CULINARY WATER MAINS TO BE PVC C-900 DR 14 (C-905 FOR SIZED 14" AND LARGER) IN BLUE SHADED AREA. WATER MAINS IN THE AREA OUTSIDE OF THE BLUE SHADED REGION MAY BE PVC C-900 DR 14 OR DUCTILE IRON THICKNESS CLASS 50 FOR SIZES UP TO 12" DIAMETER AND PVC C-905 DR 14 OR PRESSURE CLASS 250 FOR PIPE DIAMETERS 14" AND LARGER.
2. THE AREA SHADED IN PURPLE ENCOMPASSES THE HILLSIDE PROTECTION ZONES. THESE AREAS REQUIRE SPECIAL STUDIES AND APPROVALS FOR DEVELOPMENT. PLEASE SEE THE CURRENT CITY ZONE MAP FOR THE OFFICIAL HILLSIDE PROTECTION ZONE AREAS.
3. STORM DRAIN RETENTION BASINS OR INFILTRATION BASINS CANNOT BE PLACED IN THE AREAS SHADED IN RED. THEY MAY BE PLACED IN THE AREAS SHADED IN BLUE IF APPROVED BY THE CITY ENGINEER AND ARE PROTECTED WITH AN OIL/WATER SEPARATOR WITH COALESCING MEDIA.
4. STORM DRAIN RETENTION BASINS OR INFILTRATION BASINS CANNOT BE PLACED IN AREAS DESIGNATED AS A FEMA FLOOD PLAIN.

LEGEND

-  WELL HEAD
-  DWSP ZONE 1; NO RETENTION OR INFILTRATION ALLOWED IN THIS ZONE.
-  DWSP ZONE 2; NO RETENTION OR INFILTRATION ALLOWED IN THIS ZONE.
-  DWSP ZONE 3; OIL/WATER SEPARATOR REQUIRED ON RETENTION SYSTEMS AND INFILTRATION SYSTEMS
-  DWSP ZONE 4; OIL/WATER SEPARATOR REQUIRED ON RETENTION SYSTEMS AND INFILTRATION SYSTEMS
-  HILLSIDE PROTECTION ZONE
-  SPRING RECHARGE ZONE
-  SOILS - TYPE A
-  SOILS - TYPE B
-  SOILS - TYPE C
-  SOILS - TYPE C/D
-  SOILS - TYPE D



NO.	DATE	DESCRIPTION

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PRINCIPAL: M. CHANDLER
 PROJECT MANAGER: A. THOMPSON
 CHECKED BY: A. THOMPSON
 DRAWN BY: O. CURTIS
 DRAWING SCALE: 1" = 2500'
 ISSUE DATE: 8/31/2022


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NORTH OGDEN CITY CORPORATION
 PUBLIC WORKS STANDARDS
 MAP OF SENSITIVE AND PROTECTED AREAS

PROJECT NUMBER: 2020-0125
 SHEET: 54 OF 58
 SHEET NUMBER:



LEGEND	
	WELL HEAD
	DWSP ZONE 1
	DWSP ZONE 2
	DWSP ZONE 3
	DWSP ZONE 4

REV #	DATE	DESCRIPTION



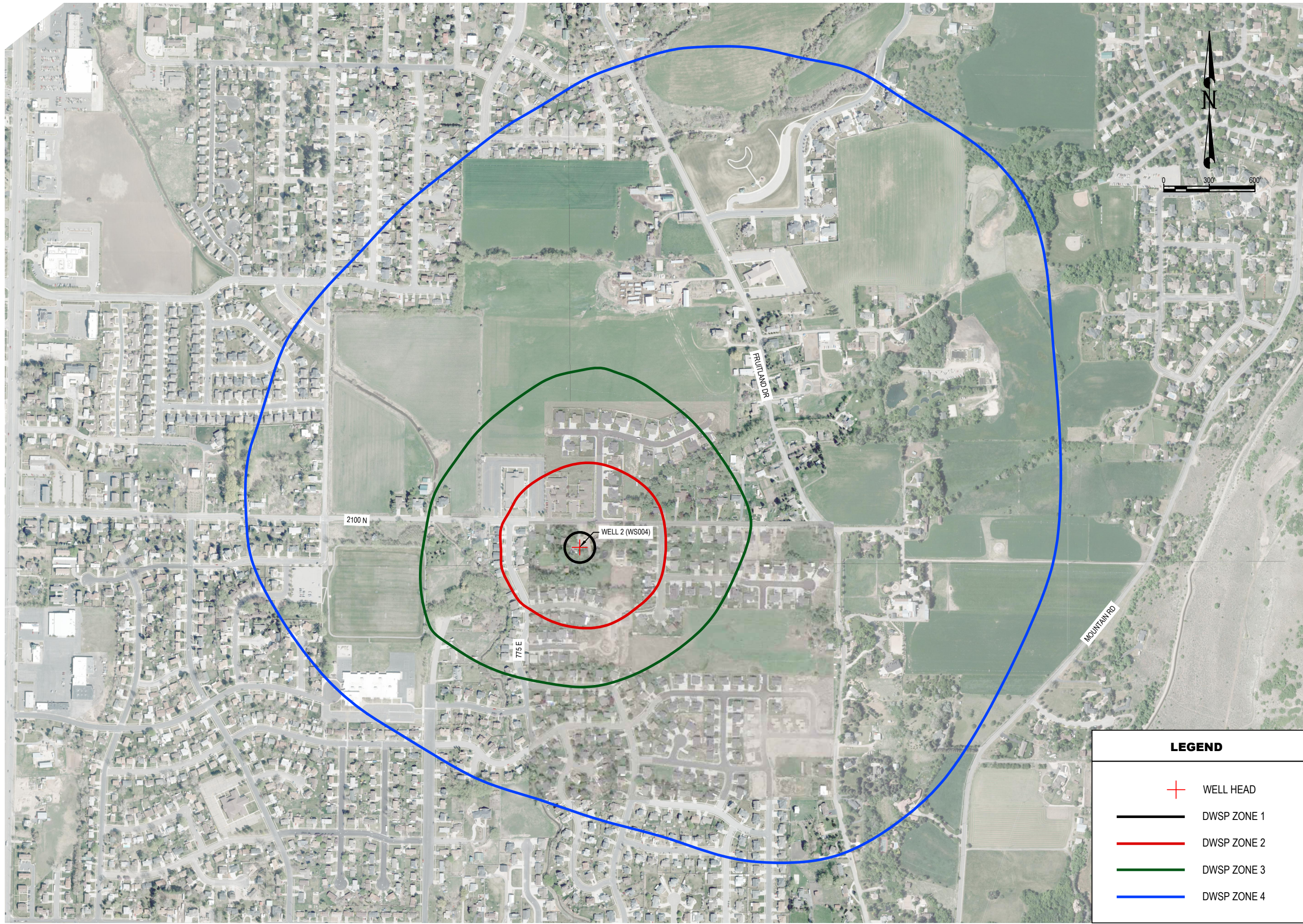
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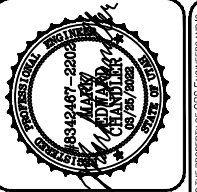
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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
 SENSITIVE AND PROTECTED AREAS - WELL 1 (WS003)

PROJECT NUMBER: 2020-0125	SHEET OF: 55 58	ISSUE DATE: MARCH 2022
DRAWN BY: A. THOMPSON, PE, PG, CHIC, HATCH		CHECKED BY: A. THOMPSON, PE, PG, CHIC, HATCH
PROJECT MANAGER:		ISSUE DATE:



LEGEND	
	WELL HEAD
	DWSP ZONE 1
	DWSP ZONE 2
	DWSP ZONE 3
	DWSP ZONE 4



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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
SENSITIVE AND PROTECTED AREAS - WELL 2 (WS004)

PROJECT NUMBER 2020-0125	SHEET OF 56 58	NUMBER 13
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REV #	BY	DATE	DESCRIPTION

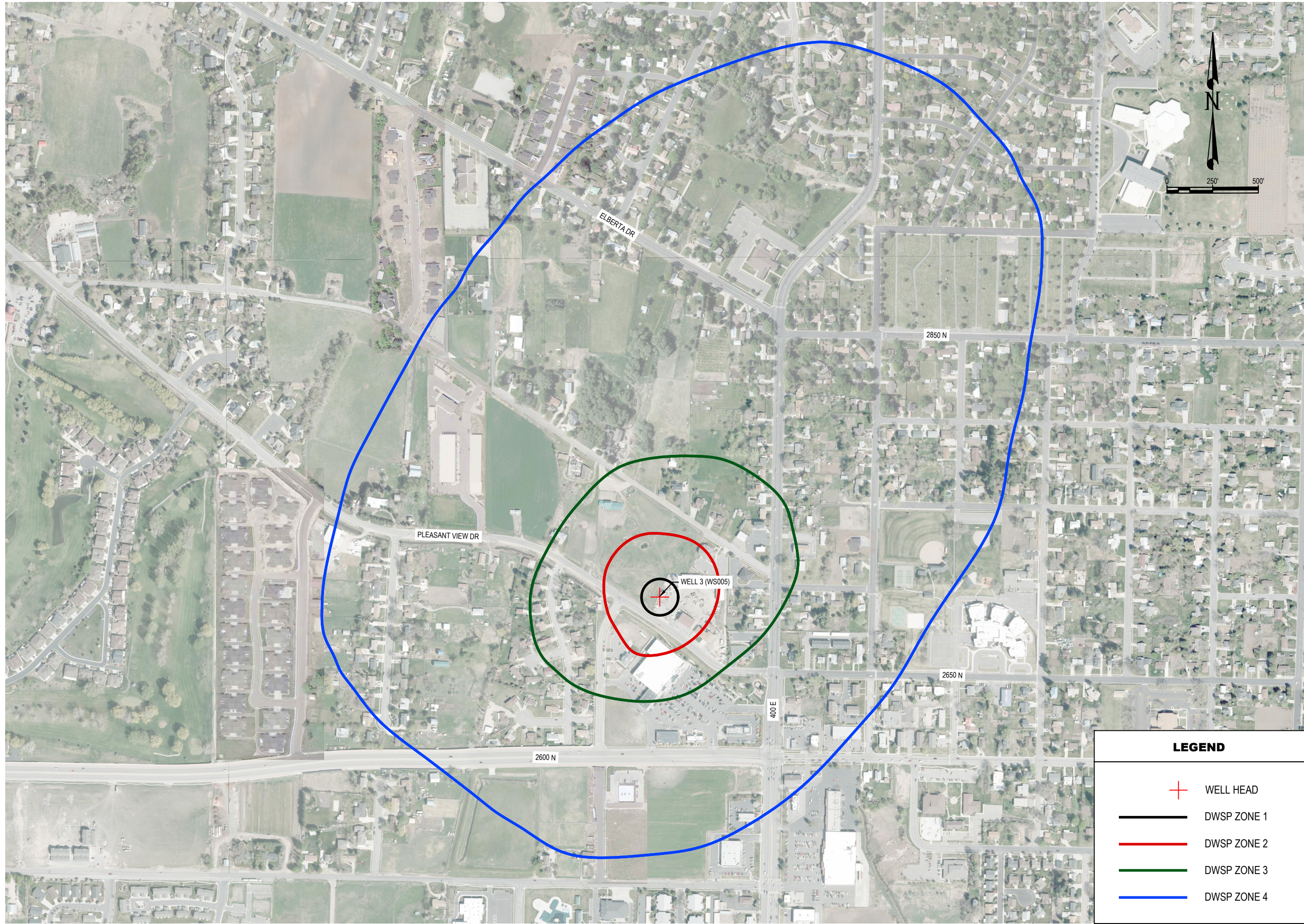
PROJECT MANAGER
A. THOMPSON, PE

CHECKED BY
R. CHANDLER, PE

DRAWN BY
P. G. HATCH

ISSUE DATE
MARCH 2022

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LEGEND	
	WELL HEAD
	DWSP ZONE 1
	DWSP ZONE 2
	DWSP ZONE 3
	DWSP ZONE 4

REV #	BY	DATE	DESCRIPTION

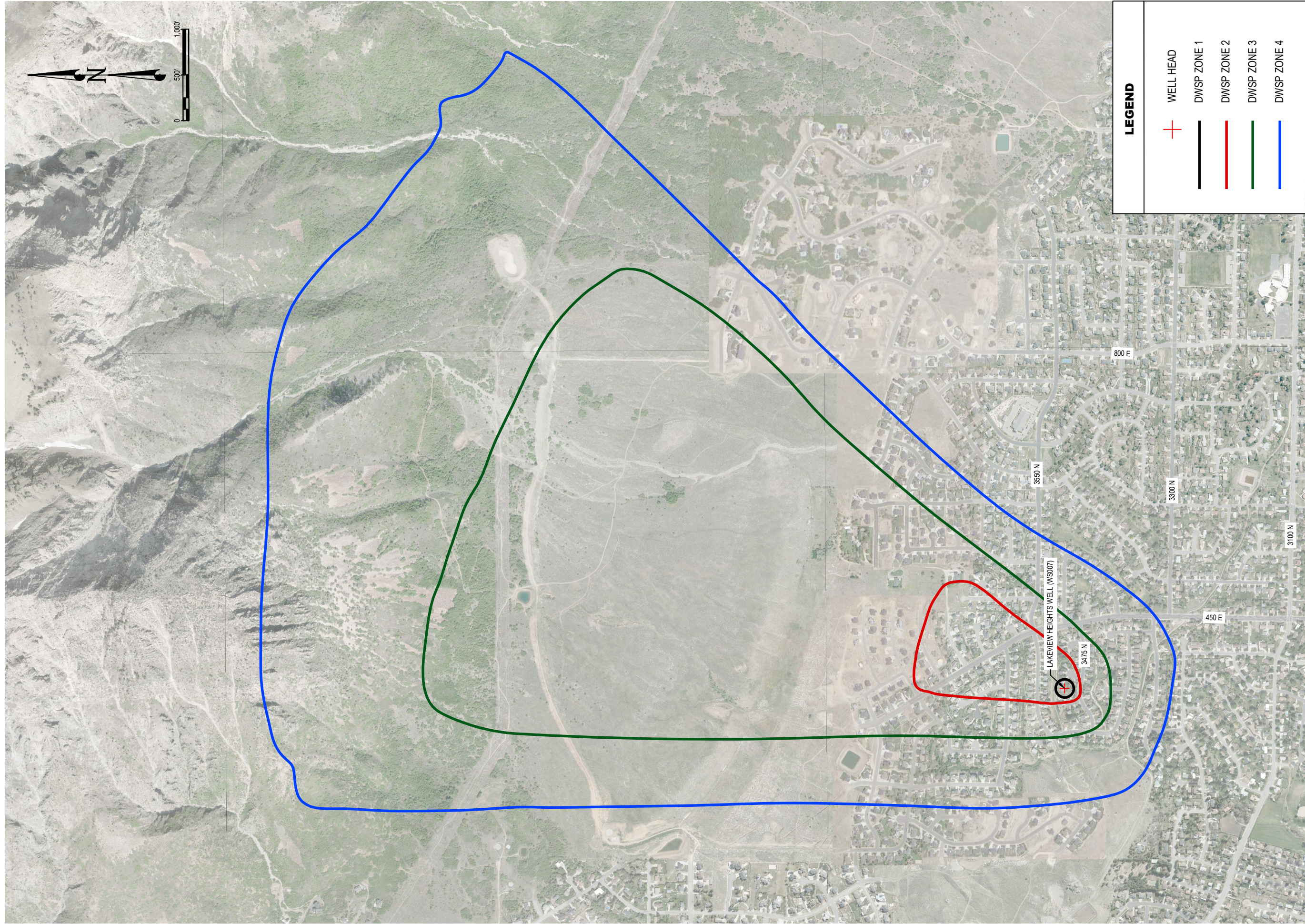


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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
 SENSITIVE AND PROTECTED AREAS - WELL 3 (WS005)

PROJECT NUMBER: 2020-0125	OF 58	ISSUE DATE MARCH 2022
SHEET 57	14	DRAWN BY A. THOMPSON, PE, PG, CFPE, HATCH
Page 72		CHECKED BY A. THOMPSON, PE

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LEGEND

	WELL HEAD
	DWSP ZONE 1
	DWSP ZONE 2
	DWSP ZONE 3
	DWSP ZONE 4

REV #	BY	DATE	DESCRIPTION



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NORTH OGDEN CITY CORPORATION
PUBLIC WORKS STANDARDS
SENSITIVE AND PROTECTED AREAS - LAKEVIEW HEIGHTS WELL (WS007)

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