



















## CHAPTER 1 GENERAL INFORMATION

### 1.1 Site Information

<b>Site Address:</b>	3821 S. Calaroga Drive, West Linn, Oregon
<b>Tax Lot No.:</b>	21E13CA01101
<b>Site Area:</b>	.086 +/- acres, approximately 3746 SF
<b>Neighborhood:</b>	Robinwood Neighborhood Association
<b>Zoning:</b>	Residential, R-15
<b>Comp. Plan:</b>	Low Density Residential
<b>Zoning Overlays:</b>	Flood Management Area, Water Resource Area, Habitat Conservation Area, Riparian Corridor
<b>Ownership:</b>	City of West Linn, 22500 Salamo Rd. #600, West Linn, Oregon, 97068

### 1.2 Proposal

The proposed project includes design and construction of a new Sanitary Sewer Pump Station, the “Calaroga Pump Station”, and associated improvements, to replace an existing pump station located at 3821 S. Calaroga Drive farther away and at a higher elevation from Trillium Creek than its current location. The existing pump station was constructed in the early 1970’s and consists of a buried wet well with a dry pit over the well and an at-grade access hatch. The below grade dry pit contains two 7.5 hp pumps, isolation and check valves, and piping. The existing pump station is located approximately 20 feet south of Trillium Creek, which feeds into the Willamette River.

The City’s 2019 Sanitary Sewer Master Plan identified the need to increase capacity of each pump in the station by 70,000 gallons per day to convey peak wet weather flows. In 2021, a more in-depth analysis of Calaroga Sanitary Sewer Pump Station was performed to identify the size of new pumps and associated wet well needed (*Calaroga Sanitary Sewer Pump Station Capacity*, Carollo Engineers, Inc., March 2021). In 2022, alternatives for Calaroga Sanitary Sewer Pump Station were prepared and the City selected construction of a new wet well located adjacent to Calaroga Drive to mitigate flood events (*Calaroga Sanitary Sewer Pump Station Alternatives Analysis*, Carollo Engineers, Inc., February 2022). The existing pump station will be replaced with a facility that is not subject to flooding during a 100-year event and has increased capacity to convey peak wet weather flows.

Historically, the 100-year flood plain has been observed at an elevation of approximately 44.00 ft, which is only a few feet lower than the pump station power panel at the top of the embankment. During the 1996 flood, the pump station was fully submerged and was rendered inoperable because the pumps were not suitable for submersible service.

The current proposal includes construction of a new 7-foot diameter wet well at a higher elevation, near S. Calaroga Drive, along with a retaining wall to support a pullout area for City maintenance vehicles and equipment, out of the paved roadway. The new wet well and vault will almost entirely be constructed

within the right-of-way of S. Calaroga Drive, with other infrastructure, such as a supporting gabion wall, constructed on the subject property adjacent to the right-of-way. To reinforce the bank to support the new improvements, a proposed gabion retaining wall will be backfilled to surround the pump station wet well and vault. The proposed finished grade will be level with the wet well and vault access covers. The City will access the pump station and wet well from the level grade created behind the gabion wall.

The pump station property is extremely limited in terms of developable area. In order to locate the pump station outside the floodplain to the greatest extent possible, the pump station will be relocated to a higher elevation within the existing public right-of-way, and several standards from the R-15 zoning district which are intended for residential uses are difficult to meet.

The new location for the wet well will ensure that all mechanical, electrical, and control infrastructure is farther away from Trillium Creek, and will have a lessor impact to the neighborhood than other alternatives, while still providing safety for the facility from risk of flooding.

The City is seeking a floodplain development permit and Conditional Use Permit with this submittal.

### **1.3 Site Description/ Surrounding Land Use**

The site is identified as “Other Property, Public or Quasi-Public” on the 2013 Residential Units and Buildable Land Inventories” map, and therefore not identified as developable for residential, although the property is zoned R-15. The site is within an established single family residential neighborhood, and is surrounded by vegetation, including cottonwood, evergreens, English ivy, and sword ferns. The site is accessed through a sloped driveway and is currently enclosed by a chain link fence and barbed wire.

The site is adjacent to Trillium Creek, which is identified as a riparian corridor according to the City of West Linn, and has a riparian corridor overlay of 100 feet on both sides of the creek, measured from the ordinary high water (OHW) line, encumbering the entire property. As such we are requesting an alternative review process as offered in Section 32.080, Water Resource Protection Area (WRA) and are proposing a robust revegetation and mitigation plan, along with a gabion wall to support the bank, as part of this proposal.

The Calaroga Pump Station is listed as Critical Infrastructure, in the City’s Natural Hazard Mitigation Plan (March 2019). The pump station is necessary in this location in order to convey sanitary sewage from the surrounding properties to the gravity conveyance system. There is no feasible alternative site available that will continue to serve the surrounding properties.

### **1.4 Neighborhood Meeting**

The Conditional Use land use process requires an applicant to prepare and present the proposed project to the applicable neighborhood association, prior to submittal of a land use application. The project team presented to the Robinwood Neighborhood Association on July 11, 2023, at 7:00 p.m. In accordance with the requirements of the Community Development Code Section 99.038, the Neighborhood Association leadership was mailed on June 8, 2023, with a request to present the project details to the Neighborhood Association. Property owners within 500 feet of the site were mailed notice of the meeting on June 22, 2023, with posted notice of the meeting on provided on the subject site.

Affidavits of mailing and posting, the meeting attendee list, presentation, and audio file from the meeting has been included with this application, in accordance with the requirements of the CDC Section 99.038.

## CHAPTER 2 APPLICABLE CRITERIA

The West Linn Community Development Code Sections applicable to this proposal include:

- Chapter 10- Single Family Residential Detached R-15
- Chapter 27- Flood Management Areas
- Chapter 32- Water Resource Protection Area
- Chapter 55- Design Review
- Chapter 99- Procedures for Decision-Making: Quasi-judicial

The following sections detail the proposal’s compliance with the applicable chapters and sections of the West Linn Community Development Code. Relevant CDC sections are provided in Bold, with Findings provided following.

### 2.1 Chapter 10: Single Family Residential Detached R-15

The site is zoned Single Family Residential Detached R-15, so the provisions of Chapter 10, Conditional Uses, apply to the proposal.

#### 10.060 CONDITIONAL USES

The following are conditional uses which may be allowed in this zoning district subject to the provisions of Chapter 60 CDC, Conditional Uses. *(Uses 1-8, which are not applicable to this proposal, are omitted for brevity)*

[...]

#### 9. Utilities, major.

**Finding:** The proposed use, a pump station, is considered a major utility per Chapter 2, Definitions, and is allowed through a Conditional Use process within the R-15 Zone. Chapter 2 defines “Utility, major” as: “A major utility facility or service includes but is not limited to: a substation; pump station; water storage tank; sewerage treatment plant; water treatment plant; and transmission lines for water, drainage or sewerage collection systems, gas or electric, or other similar use”. The Calaroga Pump Station is therefore considered a major utility.

#### 10.070 DIMENSIONAL REQUIREMENTS, USES PERMITTED OUTRIGHT AND USES PERMITTED UNDER PRESCRIBED CONDITIONS

The application’s compliance with the following standards within the R-15 Zone is addressed below.

STANDARD	REQUIREMENT	ADDITIONAL NOTES
Minimum lot size	15,000 sf	For a single-family attached or detached unit.
Average minimum lot or parcel size for a townhouse project	1,500 sf	

Minimum lot width at front lot line	45 ft	Does not apply to townhouses or cottage clusters
Average minimum lot width	80 ft	Does not apply to townhouses or cottage clusters
Minimum yard dimensions or minimum building setbacks		Front, rear, and side yard setbacks in a cottage cluster project are 10 ft. There are no additional setbacks for individual structures on individual lots, but minimum distance between structures shall follow applicable building code requirements.
Front yard	20 ft	Except for steeply sloped lots where the provisions of CDC <a href="#">41.010</a> shall apply
Interior side yard	7.5 ft	Townhouse common walls that are attached may have a 0-ft side setback.
Street side yard	15 ft	
Rear yard	20 ft	
Maximum building height	40 ft	Except for steeply sloped lots in which case the provisions of Chapter <a href="#">41</a> CDC shall apply.
Maximum lot coverage	30%	<p>Maximum lot coverage does not apply to cottage clusters. However, the maximum building footprint for a cottage cluster is less than 900 sf per dwelling unit.</p> <ul style="list-style-type: none"> <li>• This does not include detached garages, carports, or accessory structures.</li> <li>• A developer may deduct up to 200 sf for an attached garage or carport.</li> </ul>
Minimum accessway width to a lot which does not abut a street or a flag lot	15 ft	
Maximum Floor Area Ratio	0.45	<p>Maximum FAR does not apply to cottage clusters.</p> <p>Type I and II lands shall not be counted toward lot area when determining allowable floor area ratio, except that a minimum floor area ratio of 0.30 shall be allowed regardless of the classification of lands within the property. That 30 percent shall be based upon the entire property including Type I and II lands. Existing residences in excess of this standard may be replaced to their prior dimensions when damaged without the requirement that the homeowner obtain a non-conforming structures permit under Chapter <a href="#">66</a> CDC.</p>

**Finding:** The proposal complies with the requirements of Section 10.070, dimensional requirements, uses permitted outright and uses permitted under prescribed conditions, within the R-15 Zoning District. The

proposal is not considered a single-family attached dwelling, or detached unit, and so the standard for minimum lot size is not applicable. However, the subject site is 3,746 square feet, in compliance with the minimum lot size of 1,500 (townhouse) or 15,000 square feet (single family detached) in the R-15 zone when developed for a single family residential dwelling. The subject site is a polygon shape, with dimensions roughly 96 feet at the front lot line by 59 feet at the side yard, and therefore the site complies with the minimum lot width requirement of 45 feet at the front lot line. The subject site dimensions are roughly 96 feet by 59 feet, and therefore the site complies with the average minimum lot width requirement of 80 feet. The proposal complies with the minimum side yard requirement of 7.5 feet, as the proposed structure has a side yard of 59 feet on the western edge, and 53 feet on the eastern edge. The street side yard minimum setback is not applicable to the proposal, as S. Calaroga Drive abuts the front of the site, and the parcel is an interior parcel, and not a corner lot. The proposed facility complies with the maximum building height requirement of 40 feet, as new structures proposed will be constructed underground, flush and level with the existing grade, with the exception of the control panel which will be 60 to 62 inches in height. The facility will also be protected by a guardrail measuring 42 inches in height, as required for fall protection by the Oregon Structural Specialty Code and OSHA. As appurtenances, the guardrail and control panel are allowed within the front yard setback.

CDC Chapter 2—Definitions defines lot coverage as the area covered by a building or buildings, expressed as a percentage of the total land area. For the proposed use, the new building is 556 square feet. The lot is 3,746 square feet, resulting in 14.8% lot coverage. The standard for maximum lot coverage (30%) is met.

Therefore, the proposal complies with the standards of CDC 10.070, Dimensional Requirements for uses permitted outright and uses permitted under prescribed conditions, for the R-15 Zoning District.

## 10.080 DIMENSIONAL REQUIREMENTS, CONDITIONAL USES

**Except as may otherwise be established by this code, the appropriate lot or parcel size for a conditional use shall be determined by the approval authority at the time of consideration of the application based upon the criteria set forth in CDC 60.070(A) and (B). (Ord. 1636 § 8, 2014)**

**Finding:** Pump stations are considered a major utility and are therefore a conditional use in the R-15 zone. The criteria in CDC 60.070 (A) and (B) has been addressed within this narrative and application.

## 10.090 OTHER APPLICABLE DEVELOPMENT STANDARDS

**A. The following standards apply to all development including permitted uses:**

**1. Chapter 34 CDC, Accessory Structures, Accessory Dwelling Units, and Accessory Uses.**

**CDC 34.020, Accessory Uses, provides: Accessory uses are permitted uses which are customary and incidental to principal uses permitted in the zone and shall be permitted outright, or by prescribed conditions as identified below, and may be either attached or separated from the principal dwelling. Accessory uses on designated historic resources are subject to additional regulations in CDC 25.060(B).**

**Finding:** The proposed use does not include an Accessory Structure, Accessory Dwelling Unit, or an Accessory Use as defined by the Code. Therefore, the requirements of CDC 34.020 do not apply to this proposal.

**2. Chapter 35 CDC, Temporary Structures and Uses.**

**Finding:** The requirements of Chapter 35, Temporary Structures and Uses, do not apply to the proposal, as the proposed improvements are permanent and not considered to be temporary structures or uses as defined by the Code. CDC Chapter 2, Definitions, defines a Temporary Use as “A use which, by its nature, will last under two years, with the exception of drop boxes and structures/trailers serving a similar function and construction related uses and facilities”. The proposed pump station will last longer than two years and is intended to be a permanent use.

**3. Chapter 38 CDC, Additional Yard Area Required; Exceptions to Yard Requirements; Storage in Yards; Projections into Yards.**

**Finding:** As noted previously in the section addressing compliance with CDC Section 10.070, dimensional requirements, the proposed pump station complies with all requirements.

## **38.020 NO YARD REQUIRED; STRUCTURE NOT ON PROPERTY LINE**

**In zones where a side yard or a rear yard setback is not required, a structure which is not to be built on the property line shall be set back from the property line by at least three feet, except as prescribed in CDC 58.090(C)(1). (Ord. 1675 § 36, 2018)**

**Finding:** The proposed pump station and associated infrastructure is a unique use in the R-15 zoning District. This project replaces an existing pump station at the same location. The site is encumbered with a steep slope and unbuildable area. In order to raise the pump station and associated vault and infrastructure out of the floodway, the infrastructure will necessarily be constructed partially on the developable area of the site, and partially within the right-of-way. Most of the infrastructure improvements and wet well will be constructed primarily within the Calaroga Drive right-of-way, with the gabion wall reinforced improvements constructed downslope on the subject site. The only above ground project design features are the guardrail and control panel, allowed there as appurtenances.

**4. Chapter 41 CDC, Building Height, Structures on Steep Lots, Exceptions.**

**Finding:** The maximum height of the pump station’s control panel will be 62 inches, in compliance with the 40-foot maximum height limit for the R-15 zoning district. The wet well will be constructed so no improvements will be shown above ground, with the finished floor elevation at grade.

**5. Chapter 42 CDC, Clear Vision Areas, Section B. provides, “A clear vision area shall contain no planting, fence, wall, structure or temporary or permanent obstruction (except for an occasional utility pole or tree) exceeding three feet in height, measured from the top of the curb, or, where no curb exists, from the street centerline grade, except that trees exceeding this height may be located in this area, provided all branches below eight feet are removed. (Ord. 1192, 1987)**

**Finding:** All landscaping, and the stem wall construction in the right-of-way will adhere to the clear vision requirements.

**6. Chapter 44 CDC, Fences.**

**B. Fence or wall on a retaining wall. When a fence is built on a retaining wall or an artificial berm, the following standards shall apply:**

1. When the retaining wall or artificial berm is 30 inches or less in height from finished grade, the maximum fence or wall height on top of the retaining wall shall be six feet.
2. When the retaining wall or earth berm is greater than 30 inches in height, the combined height of the retaining wall and fence or wall from finished grade shall not exceed eight and one-half feet.
3. Fences or walls located on top of retaining walls or earth berms in excess of 30 inches above finished grade may exceed the total allowed combined height of eight and one-half feet; provided, that the fence or wall is located a minimum of two feet from the retaining wall and the fence or wall height shall not exceed six feet.

**Finding:** There will not be a fence surrounding the new wet well and vault improvements, but there will be a 42 inch guardrail, in compliance with the requirements of Chapter 44 CDC, Fences.

**B.** The provision and maintenance of off-street parking and loading spaces are the continuing obligation of the property owner.

**C.** No building or other permit shall be issued until plans are approved that show the property that is and will remain available for exclusive use as off-street parking and loading space as required by this chapter.

**D.** Required parking spaces and loading areas shall be improved to the standards contained in this chapter and shall be available for use at the time of the final building inspection except as provided in CDC 46.150. (Ord. 1463, 2000; Ord. 1622 § 25, 2014; Ord. 1636 § 30, 2014)

**Finding:** The site is relatively small and will not be frequented by the public. There is parking space for one City service vehicle to pull out of the right of way, in the existing driveway, which will remain. Additionally, there will be a pull-off space along the newly developed area, where the wet well and vault will be constructed. There is not an applicable use category provided in Chapter 46.090, Minimum Off-Street Parking Requirements, to calculate the appropriate number of parking spaces, but there will be room for at least one space for City staff to access the new facility with a service vehicle. Please refer to the attached Site Plan, Drawing Number G05.

## **8. Chapter 48 CDC, Access, Egress and Circulation.**

### **48.040 Minimum Vehicle Requirements For Non-Residential Uses**

Access, egress, and circulation system for all non-residential uses shall not be less than the following:

**A.** Service drives for non-residential uses shall be fully improved with hard surface pavement:

1. With a minimum of 24-foot width when accommodating two-way traffic; or
2. With a minimum of 15-foot width when accommodating one-way traffic. Horizontal clearance shall be two and one-half feet wide on either side of the driveway.
3. Meet the requirements of CDC 48.030(E)(3) through (6).

4. Pickup window driveways may be 12 feet wide unless the Fire Chief determines additional width is required.

B. All non-residential uses shall be served by one or more service drives as determined necessary to provide convenient and safe access to the property and designed according to CDC 48.030(A). In no case shall the design of the service drive or drives require or facilitate the backward movement or other maneuvering of a vehicle within a street, other than an alley.

C. All on-site maneuvering and/or access drives shall be maintained pursuant to CDC 46.130.

**Finding:** The site has existing paved access from Calaroga Drive and adequate access width, at 21 feet (existing access) and 16 feet 2 inches (new access) with sufficient horizontal clearance at the entrance to the new valve vault and wet well to accommodate a City vehicle. There is not adequate space for turn-around maneuvering on-site. Given the infrequent visits to the site and relatively low traffic volumes on S. Calaroga Drive, we are requesting review and approval as a non-conforming use under CDC 66.080 (B.2). In this instance, the existing non-conforming situation—vehicles backing out into Calaroga Drive, or backing into the parking area from Calaroga Drive—will not change from the current practice.

#### 9. Chapter 52 CDC, Signs.

**Finding:** There is not a sign proposed for the development.

#### 10. Chapter 54 CDC, Landscaping.

**Finding:** The site will have an extensive landscaping improvement. Please see findings under CDC Section 32.100 Re-Vegetation Plan Requirements, pages 34-36 of this application narrative.

B. The provisions of Chapter 55 CDC, Design Review, apply to all uses except attached and/or detached single-family dwellings, residential homes and residential facilities. (Ord. 1590 § 1, 2009; Ord. 1675 § 7, 2018; Ord. 1736 § 1 (Exh. A), 2022)

**Finding:** The proposed relocation of the pump station is considered a Class I Design Review, and the requirements of Chapter 55 are addressed beginning on page 37 of this application narrative.

## 2.2 Flood Management Areas

### 27.010 PURPOSE

A. It is the purpose of this chapter to promote public health, safety, and general welfare, and to minimize public and private losses due to flooding in flood hazard areas by provisions designed to:

1. Protect human life and health;
2. Minimize expenditure of public money for costly flood control projects;
3. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
4. Minimize prolonged business interruptions;



5. Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone, internet, and sewer lines; and streets and bridges located in special flood hazard areas;
6. Help maintain a stable tax base by providing for the sound use and development of flood hazard areas so as to minimize blight areas caused by flooding;
7. Notify potential buyers that the property is in a special flood hazard area;
8. Notify those who occupy special flood hazard areas that they assume responsibility for their actions;
9. Participate in and maintain eligibility for flood insurance and disaster relief.

B. In order to accomplish its purposes, this chapter includes methods and provisions for:

1. Restricting or prohibiting development which is dangerous to health, safety, and property due to water or erosion hazards, or which results in damaging increases in erosion or in flood heights or velocities;
2. Requiring that development vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
3. Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
4. Controlling filling, grading, dredging, and other development which may increase flood damage;
5. Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or may increase flood hazards in other areas. (Ord. 1522, 2005; Ord. 1565, 2008; Ord. 1732 § 3 (Exh. B), 2022.).

**Finding:** Applicant acknowledges and understands the purpose.

## 27.020 APPLICABILITY

This chapter shall apply to all flood management areas within the jurisdiction of West Linn. A flood management area permit is required for all development in the flood management area overlay zone. The standards that apply to flood management areas apply in addition to State and federal restrictions governing floodplains or flood hazard areas.

- A. Basis for Establishing the Special Flood Hazard Areas (SFHA). The special flood hazard areas identified by the Federal Insurance Administrator in a scientific and engineering report entitled “Flood Insurance Study: Clackamas County, Oregon and Incorporated Areas,” dated 06/2008 and revised 01/2019, FIRM Panels 41005C0018D, 41005C0019D, 41005C0038D, 41005C0257D, 41005C0259D, 41005C0260D, and 41005C0276D are hereby adopted by reference and declared

to be a part of this chapter. The FIS and FIRM panels are on file at West Linn City Hall with the Community Development Department.

B. Coordination with State of Oregon Specialty Codes. Pursuant to the requirement established in ORS 455 that the City of West Linn administers and enforces the State of Oregon Specialty Codes, the City of West Linn does hereby acknowledge that the Oregon Specialty Codes contain certain provisions that apply to the design and construction of buildings and structures located in special flood hazard areas. Therefore, this chapter is intended to be administered and enforced in conjunction with the Oregon Specialty Codes. (Ord. 1732 § 3 (Exh. B), 2022.)

**Finding:** The Flood Management Area is defined in the code as:

*“All lands contained in the flood management area overlay zone, which include: areas inundated by the base flood, flood area, and floodway as shown on the FEMA flood insurance map dated June 17, 2008; the area of inundation for the February 1996 flood; and lands which have documented evidence of flooding.”* (West Linn Community Development Code [CDC] Section 02.030 Specific Words and Terms)

The subject property is within the 1996 flood and base flood inundation areas. The FEMA flood insurance rate map (FIRM, Panel 41005C0019D, June 17, 2008, Willamette River) indicates that the site is beyond the base flood, flood area and floodway. However, the FIRM identifies the 100-year flood elevation as the 44-foot contour, which is within the subject property. The assumption is that there is an error in the map and the subject property is within FEMA flood zone AE. For these reasons, the subject property is in the Flood Management Area and relocating the pump station is subject to Chapter 27.

## 27.025 COMPLIANCE

All development within special flood hazard areas is subject to the terms of this chapter and required to comply with its provisions and all other applicable regulations.

A. Penalties for Noncompliance. No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this chapter and other applicable regulations. Violations of the provisions of this chapter by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a civil violation with penalties not to exceed the maximum amount authorized in ORS 455.895. Nothing contained herein shall prevent the City of West Linn from taking such other lawful action as is necessary to prevent or remedy any violation. (Ord. 1732 § 3 (Exh. B), 2022.)

**Finding** Applicant acknowledges and understands the penalties for noncompliance.

## 27.030 EXEMPTIONS

This chapter does not apply to work necessary to protect, repair, or maintain existing public or private structures, utility facilities, roadways, driveways, accessory uses, and exterior improvements, or replace small public structures, utility facilities, or roadways in response to emergencies. Within 30 days after the work has been completed, the party responsible for the work shall initiate a flood management permit designed to analyze any changes effectuated during the emergency and mitigate adverse impacts. (Ord. 1522, 2005; Ord. 1732 § 3 (Exh. B), 2022.)

**Finding** The sanitary sewer pump station replacement is not an emergency project. The exemption is not applicable.

## 27.040 PROHIBITED USES

Prohibited uses in flood management areas include the following:

- A. Any use prohibited in the base zone.
- B. Uncontained areas of hazardous materials as defined by the Oregon Department of Environmental Quality. (Ord. 1732 § 3 (Exh. B), 2022.)

**Finding:** The proposed use is for replacement of an existing sanitary sewer pump station and associated grading. The property is zoned R-15. Major utilities are a Conditional Use within the R-15 zoning district. According to CDC Section 02.030, a major utility includes a pump station. Therefore, the pump station is not a prohibited use.

## 27.045 CRITICAL FACILITIES

Construction of new critical facilities shall be, to the greatest extent possible, located outside the limits of the SFHA. Construction of new critical facilities shall only be permissible within the SFHA if no feasible alternative site is available. Critical facilities constructed within the SFHA shall have the lowest floor elevated three feet or to the height of the 500-year flood, whichever is higher. Access to and from the critical facility should also be protected to the height utilized above. Floodproofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into floodwaters. Access routes elevated to or above the level of the base flood elevation shall be provided to all critical facilities to the extent possible. (Ord. 1732 § 3 (Exh. B), 2022.)

**Finding:** A critical facility is defined as:

*“A facility for which even a slight chance of flooding might be too great. Critical facilities include but are not limited to schools, nursing homes, hospitals, fire and emergency response installations, and installations which produce, use or store hazardous materials or hazardous waste.”* (CDC Section 02.030 Specific Words and Terms)

The Natural Hazard Mitigation Plan identifies critical facilities as those that are critical to government response and recovery activities and lists the critical facilities as City Hall, Public Works/Operations, the library, fire stations #55, #58 and #59 and the police department. A separate category, Critical Infrastructure, lists infrastructure that provides necessary services for emergency response, including the Calaroga Pump Station (Natural Hazard Mitigation Plan, March 2019).

A special flood hazard area (SFHA) is defined as:

*“The land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. It is shown on the flood insurance rate map (FIRM) as Zone ... AE...”*(CDC Section 02.030 Specific Words and Terms)

The pump station is necessary in this location in order to convey sanitary sewage from the surrounding properties to the gravity conveyance system. There is no feasible alternative site available that will continue to serve the surrounding properties. The pump station property is entirely within the SFHA except for the portion in the public right-of-way. In order to locate the pump station outside the

floodplain to the greatest extent possible, the pump station will be relocated to a higher elevation within the existing public right-of-way.

A proposed gabion retaining wall will be backfilled to surround the pump station wet well and vault. The proposed finished grade will be level with the wet well and vault access covers. The City will access the pump station and wet well from the level grade created behind the gabion wall. The electrical power and control panels will be located above the floodplain on top of the level grade. Structures will be floodproofed and sealed to prevent sewage from releasing into any floodwaters, for example, sealing pipe projections and lining the concrete wet well. Access to the wet well, vault and electrical panels will be above the flood elevation (flood elevation is 44-feet and the final grade will be 47 feet).

## 27.050 ABROGATION AND SEVERABILITY

A. This chapter is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this chapter and another chapter, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

B. This chapter and the various parts thereof are hereby declared to be severable. If any section, clause, sentence, or phrase of this chapter is held to be invalid or unconstitutional by any court of competent jurisdiction, then said holding shall in no way effect the validity of the remaining portions of this chapter. (Ord. 1732 § 3 (Exh. B), 2022.)

## 27.055 INTERPRETATION, WARNING, AND DISCLAIMER OF LIABILITY

A. In the interpretation and application of this chapter, all provisions shall be:

1. Considered as minimum requirements;
2. Liberally construed in favor of the governing body; and
3. Deemed neither to limit nor repeal any other powers granted under state statutes.

B. The degree of flood protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by manmade or natural causes. This chapter does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages.

C. This chapter shall not create liability on the part of the City of West Linn, any officer or employee thereof, or the Federal Insurance Administrator for any flood damages that result from reliance on this chapter or any administrative decision lawfully made hereunder. (Ord. 1732 § 3 (Exh. B), 2022.)

**Finding:** Applicant acknowledges and understands the legal applicability and liability.

## 27.060 ADMINISTRATION

A. The Planning Manager is hereby appointed to administer, implement, and enforce this chapter by granting or denying development permits in accordance with its provisions. The Floodplain Administrator may delegate authority to implement these provisions.

B. Duties of the floodplain administrator, or their designee, shall include, but not be limited to:

1. Review all development permits to determine that:

- a. The permit requirements of this chapter have been satisfied;
- b. All other required local, state, and federal permits have been obtained and approved;
- c. Review all development permits to determine if the proposed development is located in a floodway. If located in the floodway assure that the floodway provisions in CDC 27.090 are met;
- d. Review all development permits to determine if the proposed development is located in an area where base flood elevation (BFE) data is available either through the flood insurance study (FIS) or from another authoritative source. If BFE data is not available then ensure compliance with the provisions of CDC 27.070(G);
- e. Provide to building officials the base flood elevation (BFE) and requirement for one foot of freeboard applicable to any building requiring a development permit;
- f. Review all development permit applications to determine if the proposed development qualifies as a substantial improvement as defined in Chapter 2 CDC;
- g. Review all development permits to determine if the proposed development activity is a watercourse alteration. If a watercourse alteration is proposed, ensure compliance with the provisions in CDC 27.070(A); and
- h. Review all development permits to determine if the proposed development activity includes the placement of fill or excavation.

2. The following information shall be obtained and maintained and shall be made available for public inspection as needed:

- a. Obtain, record, and maintain the actual elevation (in relation to mean sea level) of the lowest floor (including basements) and all attendant utilities of all new or substantially improved structures where base flood elevation (BFE) data is provided through the flood insurance study (FIS), flood insurance rate map (FIRM), or obtained in accordance with CDC 27.070(G).
- b. Obtain and record the elevation (in relation to mean sea level) of the natural grade of the building site for a structure prior to the start of construction and the placement of

any fill and ensure that the requirements of CDC 27.090 and subsection (B)(1)(b) of this section are adhered to.

c. Upon placement of the lowest floor of a structure (including basement) but prior to further vertical construction, obtain documentation, prepared and sealed by a professional licensed surveyor or engineer, certifying the elevation (in relation to mean sea level) of the lowest floor (including basement).

d. Where base flood elevation data are utilized, obtain as-built certification of the elevation (in relation to mean sea level) of the lowest floor (including basement) prepared and sealed by a professional licensed surveyor or engineer, prior to the final inspection.

e. Maintain all elevation certificates (EC) submitted to the community.

f. Obtain, record, and maintain the elevation (in relation to mean sea level) to which the structure and all attendant utilities were floodproofed for all new or substantially improved floodproofed structures where allowed under this chapter and where base flood elevation (BFE) data is provided through the FIS, FIRM, or obtained in accordance with CDC 27.070(G).

g. Maintain all floodproofing certificates required under this chapter.

h. Record and maintain all variance actions, including justification for their issuance.

i. Obtain and maintain all hydrologic and hydraulic analyses performed as required under CDC 27.090.

j. Record and maintain all substantial improvement and substantial damage calculations and determinations as required under subsection (B)(4) of this section.

k. Maintain for public inspection all records pertaining to the provisions of this chapter.

3. Requirement to Notify Other Entities and Submit New Technical Data.

a. Community Boundary Alterations. The Floodplain Administrator shall notify the Federal Insurance Administrator in writing whenever the boundaries of the community have been modified by annexation or the community has otherwise assumed authority or no longer has authority to adopt and enforce floodplain management regulations for a particular area, to ensure that all flood hazard boundary maps (FHBM) and flood insurance rate maps (FIRM) accurately represent the community's boundaries. Include within such notification a copy of a map of the community suitable for reproduction clearly delineating the new corporate limits or new area for which the community has assumed or relinquished floodplain management regulatory authority.

b. Watercourse Alterations. Notify adjacent communities, the Department of Land Conservation and Development, and other appropriate State and federal agencies, prior to any alteration or relocation of a watercourse, and submit evidence of such notification

to the Federal Insurance Administration. This notification shall be provided by the applicant to the Federal Insurance Administration as a letter of map revision (LOMR) along with either:

- 1) A proposed maintenance plan to assure the flood carrying capacity within the altered or relocated portion of the watercourse is maintained; or
- 2) Certification by a registered professional engineer that the project has been designed to retain its flood carrying capacity without periodic maintenance.

The applicant shall be required to submit a conditional letter of map revision (CLOMR) when required under subsection (B)(3)(c) of this section. Ensure compliance with all applicable requirements in subsection (B)(3)(c) of this section and CDC 27.070(A).

c. Requirement to Submit New Technical Data. A community's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, a community shall notify the Federal Insurance Administrator of the changes by submitting technical or scientific data in accordance with 44 C.F.R. 65.3. The community may require the applicant to submit such data and review fees required for compliance with this section through the applicable FEMA letter of map change (LOMC) process.

The Floodplain Administrator shall require a conditional letter of map revision prior to the issuance of a floodplain development permit for:

- 1) Proposed floodway encroachments that increase the base flood elevation; and
- 2) Proposed development which increases the base flood elevation by more than one foot in areas where FEMA has provided base flood elevations but no floodway.

An applicant shall notify FEMA within six months of project completion when an applicant has obtained a conditional letter of map revision (CLOMR) from FEMA. This notification to FEMA shall be provided as a letter of map revision (LOMR).

4. Substantial Improvement and Substantial Damage Assessments and Determinations. Conduct substantial improvement (SI) (as defined in Chapter 2 CDC) reviews for all structural development proposal applications and maintain a record of SI calculations within permit files in accordance with subsection (B)(2) of this section. Conduct substantial damage (SD) (as defined in Chapter 2 CDC) assessments when structures are damaged due to a natural hazard event or other causes. Make SD determinations whenever structures within the special flood hazard area (as established in CDC 27.020(A)) are damaged to the extent that the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

C. Establishment of Development Permit.

1. A development permit shall be obtained before construction or development begins within any area horizontally within the special flood hazard area established in CDC 27.020(A). The development permit shall be required for all structures, including manufactured dwellings, and for all other development, as defined in Chapter 2 CDC, including fill and other development activities.

2. Application for a development permit may be made on forms furnished by the Floodplain Administrator and may include, but not be limited to, plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities, and the location of the foregoing. Specifically, the following information is required:

- a. In riverine flood zones, the proposed elevation (in relation to mean sea level), of the lowest floor (including basement) and all attendant utilities of all new and substantially improved structures; in accordance with the requirements of subsection (B)(2) of this section.
- b. Proposed elevation in relation to mean sea level to which any nonresidential structure will be floodproofed.
- c. Certification by a registered professional engineer or architect licensed in the State of Oregon that the floodproofing methods proposed for any nonresidential structure meet the floodproofing criteria for nonresidential structures in CDC 27.080(C)(3).
- d. Description of the extent to which any watercourse will be altered or relocated.
- e. Base flood elevation data for subdivision proposals or other development when required per subsection (B) of this section and CDC 27.070(F).
- f. Substantial improvement calculation for any improvement, addition, reconstruction, renovation, or rehabilitation of an existing structure.
- g. The amount and location of any fill or excavation activities proposed.

D. Variance Procedure. The issuance of a variance is for floodplain management purposes only. Flood insurance premium rates are determined by federal statute according to actuarial risk and will not be modified by the granting of a variance.

1. Conditions for Variances.

- a. Generally, variances may be issued for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, in conformance with the provisions of subsections (D)(1)(c), (D)(1)(e) and (D)(2) of this section. As the lot size increases beyond one-half acre, the technical justification required for issuing a variance increases.



- b. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.
- c. Variances shall not be issued within any floodway if any increase in flood levels during the base flood discharge would result.
- d. Variances shall only be issued upon:
  - 1) A showing of good and sufficient cause;
  - 2) A determination that failure to grant the variance would result in exceptional hardship to the applicant;
  - 3) A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
- e. Variances may be issued by a community for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that the criteria of subsections (D)(1)(b) through (d) of this section are met, and the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.

2. Variance Notification. Any applicant to whom a variance is granted shall be given written notice that the issuance of a variance to construct a structure below the base flood elevation will result in increased premium rates for flood insurance and that such construction below the base flood elevation increases risks to life and property. Such notification and a record of all variance actions, including justification for their issuance, shall be maintained in accordance with subsection (B)(2) of this section. (Ord. 1732 § 3 (Exh. B), 2022.)

**Finding:** The applicant understands and acknowledges the role of the Floodplain Administrator and the submittal items required for development within the SFHA. The applicant is not requesting a variance as part of this request, so the variance criterion is not applicable.

## 27.070 GENERAL STANDARDS

In all special flood hazard areas, the following standards shall be adhered to:

### A. Alteration of Watercourses.

- 1. Require that the flood carrying capacity within the altered or relocated portion of said watercourse is maintained. Require that maintenance is provided within the altered or relocated portion of said watercourse to ensure that the flood carrying capacity is not diminished. Require compliance with CDC 27.060(B)(3)(b) and (c).

**Finding:** The project will not alter the watercourse. Therefore, the alteration of watercourse criterion is not applicable.

## B. Anchoring.

1. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
2. All manufactured dwellings shall be anchored per CDC 27.080(C)(4).

**Finding:** The wet well and valve vault will be constructed within the existing soil (using shoring for the wet well) as well as surrounded by drain rock proposed as backfill behind the proposed gabion wall. The gabion wall is generally self-draining which mitigates hydrostatic pressure and associated impacts.

## C. Construction Materials and Methods.

1. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
2. All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

**Finding:** Construction materials include 9-gauge galvanized welded wire and drain rock for the gabion walls, concrete wet well and vault and submersible pumps and stainless-steel components. These materials and equipment are resistant to flood damage.

Construction methods and practices will include best management practices for erosion control, revegetating the Water Resource Area and conducting work outside the wet weather season. The gabion wall is porous allowing for water to flow in and around it, while also having the structural integrity to accommodate variable settlement conditions.

## D. Utilities and Equipment.

### 1. Water Supply, Sanitary Sewer and On-Site Waste Disposal Systems.

[...]

- b. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters.

[...]

**Finding:** The project will replace an existing sanitary sewage pump station. The rim of the existing pump station is located at approximately 33 feet. The rim of the proposed pump station will be at approximately 47 feet, or three feet above the base flood elevation. Raising the access above the flood elevation will eliminate infiltration of flood waters through entering from the top of the pump station. The wet well and vault will be equipped with submersible pumps and instruments. The concrete wet well will be lined with an epoxy liner to prevent corrosion of the concrete. Penetrations into the wet well will be sealed.

### 2. Electrical, Mechanical, Plumbing, and Other Equipment.

- a. Electrical, heating, ventilating, air conditioning, plumbing, duct systems, and other equipment and service facilities shall be elevated at or above one foot above the base flood level or shall be designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads

and stresses, including the effects of buoyancy, during conditions of flooding. In addition, electrical, heating, ventilating, air conditioning, plumbing, duct systems, and other equipment and service facilities, if replaced as part of a substantial improvement, shall meet all the requirements of this section.

**Finding:** The base flood elevation is 44 feet. The top of concrete will be approximately 47 ½ feet. Electrical control panels will be constructed above the top of concrete. Therefore, electrical control panels will be more than one foot above the base flood level. Below ground electrical conduit will be installed with conduit seals and PVC coated steel conduit sleeves. The wet well and vault will be equipped with submersible pumps and instruments.

#### E. Tanks.

1. Underground tanks shall be anchored to prevent flotation, collapse and lateral movement under conditions of the base flood.
2. Above-ground tanks shall be installed at or above one foot above the base flood level or shall be anchored to prevent flotation, collapse, and lateral movement under conditions of the base flood.

**Finding:** The project includes a wet well, which is a concrete holding tank for sewage as it is pumped to the gravity system. The wet well will be below-ground surrounded by existing fill and proposed gabion wall and drain rock backfill. The gabion wall will allow water to flow through and drain from the backfilled area which will prevent hydrostatic conditions that could otherwise lead to collapse or lateral movement.

#### F. Subdivision Proposals and Other Proposed Developments.

1. All new subdivision proposals and other proposed new developments (including proposals for manufactured dwelling parks and subdivisions) greater than 50 lots or five acres, whichever is the lesser, shall include within such proposals base flood elevation data.
2. Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for any land division proposal.
3. All new subdivision proposals and other proposed new developments (including proposals for manufactured dwelling parks and subdivisions) shall:
  - a. Be consistent with the need to minimize flood damage.
  - b. Have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize or eliminate flood damage.
  - c. Have adequate drainage provided to reduce exposure to flood hazards.

**Finding:** The project does not consist of a subdivision or other proposed development. These criteria are not applicable.

#### G. Use of Other Base Flood Elevation Data.

1. When base flood elevation data has not been provided in accordance with CDC 27.020, the local floodplain administrator shall obtain, review, and reasonably utilize any base flood elevation data available from a federal, State, or other source, in order to administer this section and CDC 27.080, 27.090, and 27.100. All new subdivision proposals and other proposed new developments (including proposals for manufactured dwelling parks and subdivisions) must meet the requirements of subsection (F) of this section.
2. Base flood elevations shall be determined for development proposals that are five acres or more in size or are 50 lots or more, whichever is lesser, in any A zone that does not have an established base flood elevation. Development proposals located within a riverine unnumbered A zone shall be reasonably safe from flooding; the test of reasonableness includes use of historical data, high water marks, FEMA provided base level engineering data, and photographs of past flooding. When no base flood elevation data is available, the elevation requirement for development proposals within a riverine unnumbered A zone is a minimum of two feet above the highest adjacent grade, to be reasonably safe from flooding. Failure to elevate at least two feet above grade in these zones may result in higher insurance rates.

**Finding:** Base flood elevation is available from the Flood Insurance Rate Map (FIRM) dated June 17, 2008 and associated Flood Insurance Study for Clackamas County, Oregon and Incorporated Areas, revised and reprinted December 6, 2019. See FIRM Panel 41005C0019D.

#### H. Structures Located in Multiple or Partial Flood Zones. In coordination with the State of Oregon Specialty Codes:

1. When a structure is located in multiple flood zones on the community's flood insurance rate maps (FIRM) the provisions for the more restrictive flood zone shall apply.
2. When a structure is partially located in a special flood hazard area, the entire structure shall meet the requirements for new construction and substantial improvements.

**Finding:** The pump station is entirely within flood zone AE.

#### I. Balanced Cut and Fill.

1. Development, excavation, and fill shall be performed in a manner to maintain or increase flood storage and conveyance capacity and not increase design flood elevations.
2. No net fill increase in any floodplain is allowed. All fill placed in a floodplain shall be balanced with an equal amount of soil material removal. Excavation areas shall not exceed fill areas by more than 50 percent of the square footage. Any excavation below the ordinary high water line shall not count toward compensating for fill.
3. Excavation to balance a fill shall be located on the same lot or parcel as the fill unless it is not reasonable or practicable to do so. In such cases, the excavation shall be located in the same drainage basin and as close as possible to the fill site, so long as the proposed excavation and fill will not increase flood impacts for surrounding properties as determined through hydrologic and hydraulic analysis.

**Finding:** The subject property is entirely within the floodplain and it is not practicable to balance the fill on the same lot. The proposed fill will not increase flood impacts for surrounding properties, as determined by the No-Rise Certification (see *Hydraulic Report for West Linn Calaroga Sanitary Sewer Pump Station Replacement* prepared by David Evans and Associates, Inc., dated July 2023). The applicant will locate a site within the drainage basin for excavation to balance the fill. The applicant requests a condition of approval to allow for site identification, analysis, and excavation to occur after the land use review and permit issuance.

**J. Minimum Finished Floor Elevation.**

1. Minimum finished floor elevations must be at least one foot above the design flood height or highest flood of record, whichever is higher, for new habitable structures in the flood area.

**Finding:** The pump station is not a habitable structure. This criterion is not applicable.

**K. Other Requirements.**

1. New culverts, stream crossings, and transportation projects shall be designed as balanced cut and fill projects or designed not to significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in flood management areas and to minimize erosive velocities. Stream crossings shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.
2. Excavation and fill required for the construction of detention facilities or structures, and other facilities, such as levees, specifically shall be designed to reduce or mitigate flood impacts and improve water quality. Levees shall not be used to create vacant buildable land. (Ord. 1732 § 3 (Exh. B), 2022.)

**Finding:** The pump station is not a culvert, stream crossing, transportation, or detention facility project. This criterion is not applicable.

## 27.080 SPECIFIC STANDARDS FOR RIVERINE FLOOD ZONES

These specific standards shall apply to all new construction and substantial improvements in addition to the general standards contained in CDC 27.070.

**A. Flood Openings.**

1. All new construction and substantial improvements with fully enclosed areas below the lowest floor (excluding basements) are subject to the following requirements:
2. Enclosed areas below the base flood elevation, including crawl spaces, shall:
  - a. Be designed to automatically equalize hydrostatic flood forces on walls by allowing for the entry and exit of floodwaters;
  - b. Be used solely for parking, storage, or building access;

c. Be certified by a registered professional engineer or architect or meet or exceed all of the following minimum criteria:

- 1) A minimum of two openings,
- 2) The total net area of nonengineered openings shall be not less than one square inch for each square foot of enclosed area, where the enclosed area is measured on the exterior of the enclosure walls,
- 3) The bottom of all openings shall be no higher than one foot above grade,
- 4) Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they shall allow the automatic flow of floodwater into and out of the enclosed areas and shall be accounted for in the determination of the net open area,
- 5) All additional higher standards for flood openings in the State of Oregon Residential Specialty Codes Section R322.2.2 shall be complied with when applicable.

**Finding:** The criteria for flood openings is specific to fully enclosed areas. The proposed gabion walls allow for the entry and exit of floodwaters and do not create fully enclosed areas. These criteria are not applicable.

**B. Garages.**

1. Attached garages may be constructed with the garage floor slab below the base flood elevation (BFE) in riverine flood zones, if the following requirements are met:

- a. If located within a floodway the proposed garage must comply with the requirements of CDC 27.090.
- b. The floors are at or above grade on not less than one side;
- c. The garage is used solely for parking, building access, and/or storage;
- d. The garage is constructed with flood openings in compliance with subsection (A) of this section to equalize hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwater;
- e. The portions of the garage constructed below the BFE are constructed with materials resistant to flood damage;
- f. The garage is constructed in compliance with the standards in CDC 27.070; and
- g. The garage is constructed with electrical and other service facilities located and installed so as to prevent water from entering or accumulating within the components during conditions of the base flood.

2. Detached garages must be constructed in compliance with the standards for appurtenant structures in subsection (C)(6) of this section or nonresidential structures in subsection (C)(3) of this section depending on the square footage of the garage.

**Finding:** A garage is not part of the proposal. This criterion is not applicable.

C. For Riverine Special Flood Hazard Areas With Base Flood Elevations. In addition to the general standards listed in CDC 27.070 the following specific standards shall apply in riverine (noncoastal) special flood hazard areas with base flood elevations (BFE): zones A1-30, AH, and AE.

1. Before Regulatory Floodway. In areas where a regulatory floodway has not been designated, no new construction, substantial improvement, or other development (including fill) shall be permitted within zones A1-30 and AE on the community's flood insurance rate map (FIRM), unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

**Finding:** The Willamette River has been designated as a regulated floodway. Trillium Creek, which borders the subject property, flows into the Willamette River and is not a regulated floodway. The subject site is in flood zone AE and the base flood elevation is 44 feet. A hydraulic analysis indicates that there will be no rise in flood elevations as a result of the fill in the floodplain. (See *Hydraulic Report for West Linn Calaroga Sanitary Sewer Pump Station Replacement* prepared by David Evans and Associates, Inc., dated July 2023.)

[...]

### 3. Nonresidential Construction.

- a. New construction, conversion to, and substantial improvement of any commercial, industrial, or other nonresidential structure shall:

- 1) Have the lowest floor, including basement, elevated at or above one foot above the base flood elevation (BFE) or, together with attendant utility and sanitary facilities:

- (A) Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;

**Finding:** The pump station wet well storage tank (structure) will be below the base flood elevation as there is no practical alternative while still pumping sewage to the gravity conveyance system. The wet well and vault will be constructed of concrete which is substantially impermeable to the passage of water.

- (B) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;

**Finding:** The gabion walls will be baskets filled with 4" – 8" rocks (meeting Section 00390.11(b) of Standard Specifications) that allow for water to freely move through it. The wall is a gravity wall that resists the soil pressure/hydrostatic forces from the retained soil by its own weight and friction. The wet well and valve vault will be below the finished grade.

(C) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this section based on their development and/or review of the structural design, specifications and plans. Such certifications shall be provided to the Floodplain Administrator as set forth in CDC 27.060(B)(2).

**Finding:** See attached Elevation Certificate dated August 29, 2023.

b. Nonresidential structures that are elevated, not floodproofed, shall comply with the standards for enclosed areas below the lowest floor in subsection (A) of this section.

**Finding:** See the response in subsection (A) of this section.

c. Applicants floodproofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot below the floodproofed level (e.g., a building floodproofed to the base flood level will be rated as one foot below).

**Finding:** The Applicant understands and acknowledges the calculation of flood insurance premiums for floodproofing nonresidential buildings.

[...]

## 27.090 STANDARDS FOR FLOODWAYS

Located within the special flood hazard areas established in CDC 27.020(A) are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of the floodwaters which carry debris, potential projectiles, and erosion potential, the following provisions apply:

A. Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless:

1. Certification by a registered professional civil engineer is provided demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment shall not result in any increase in flood levels within the community during the occurrence of the base flood discharge; or
2. A community may permit encroachments within the adopted regulatory floodway that would result in an increase in base flood elevations; provided, that a conditional letter of map revision (CLOMR) is applied for and approved by the Federal Insurance Administrator, and the requirements for such revision as established under 44 CFR 65.12 are fulfilled.

B. If the requirements of subsection (A) of this section are satisfied, all new construction, substantial improvements, and other development shall comply with all other applicable flood hazard reduction provisions of CDC 27.070, 27.080, this section, and CDC 27.100. (Ord. 1732 § 3 (Exh. B), 2022.)

**Finding:** The Willamette River is a regulatory floodway. The project site is within Flood Zone AE and not within the regulatory floodway. The proposed project will not include encroachments into the regulatory floodway.



## 27.100 STANDARDS FOR SHALLOW FLOODING AREAS

Shallow flooding areas appear on FIRMs as AO zones with depth designations or as AH zones with base flood elevations.

[...]

**Finding** The property is in the AE zone. This section is not applicable.

## 27.110 CONSISTENCY

Where the provisions of this chapter are less restrictive or conflict with comparable provisions of this code, regional, State, or federal law, the provisions that are more restrictive shall govern. Where this chapter imposes restrictions that are more stringent than regional, State and federal law, the provisions of this chapter shall govern. (Ord. 1732 § 3 (Exh. B), 2022. Formerly 27.170.)

**Finding:** Applicant acknowledges and understands the provisions that govern development in the floodplain.

## 2.3 Chapter 32: Water Resource Protection Area

The entire project site is within the Water Resource Protection Area, and thus the requirements of Chapter 32, apply.

### 32.060 APPROVAL CRITERIA (STANDARD PROCESS)

No application for development on property containing a WRA shall be approved unless the approval authority finds that the proposed development is consistent with the following approval criteria, or can satisfy the criteria by conditions of approval:

A. WRA protection/minimizing impacts.

1. Development shall be conducted in a manner that will avoid or, if avoidance is not possible, minimize adverse impact on WRAs.
2. Mitigation and re-vegetation of disturbed WRAs shall be completed per CDC [32.090](#) and [32.100](#), respectively.

**Finding:** Calaroga Pump Station Natural Resources Site Review Technical Memorandum (DEA, dated June 27, 2023) evaluated the existing resource conditions on the site. The site does not contain any heritage trees, or wetlands on site. The pump station tax lot is situated in a moderate to steeply sloping ravine in a suburban wooded setting. Trillium Creek, a tributary to the Willamette River, flows along the confined ravine bottom (see attached Photo Log). The existing pump station facilities consist of a short access driveway and the existing pump station that is surrounded by chain link fence. These facilities may have been graded into the hillside or placed along a natural narrow bench adjacent to the top of the stream bank. Areas bordering the developed portion of the site contain a mix of native and non-native riparian vegetation. Native vegetation consisted of an overstory of black cottonwood (*Populus balsamifera*), and

red alder (*Alnus rubra*), with red cedar (*Thuja plicata*) observed nearby. Native understory consists of sword fern (*Polystichum munitum*). Non-native species consisted of English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus armeniacus*). The ivy is mixed in with native vegetation and predominantly found along the edges of the access driveway and Calaroga Drive. The blackberry primarily occurs as a large patch along the east and south sides of the pump station.

The City is proposing to rebuild the pump station, elevating it above the 100 year flood elevation. This will include installation of a gabion retaining wall, back filling the area behind the wall to a level ground surface, and constructing the new pump station. A manhole will be left in place where the current pump station resides. The existing access driveway will also be left in place. No work is proposed below the OHW mark of Trillium Creek.

As part of this proposal, the City will be adding an extensive landscape plan, and will further reinforce the steep bank within the riparian area with a gabion wall, which will allow storm water runoff to be slowed prior to entering Trillium Creek. Additionally, the City will be providing necessary vegetated landscaping for mitigating the impacts of the development.

## **B. Storm water and storm water facilities.**

1. Proposed developments shall be designed to maintain the existing WRAs and utilize them as the primary method of storm water conveyance through the project site unless:

- a. The surface water management plan calls for alternate configurations (culverts, piping, etc.); or
- b. Under CDC [32.070](#), the applicant demonstrates that the relocation of the water resource will not adversely impact the function of the WRA including, but not limited to, circumstances where the WRA is poorly defined or not clearly channelized.

Re-vegetation, enhancement and/or mitigation of the re-aligned water resource shall be required as applicable.

2. Public and private storm water detention, storm water treatment facilities and storm water outfall or energy dissipaters (e.g., rip rap) may encroach into the WRA if:

- a. Accepted engineering practice requires it;
- b. Encroachment on significant trees shall be avoided when possible, and any tree loss shall be consistent with the City's Tree Technical Manual and mitigated per CDC [32.090](#);
- c. There shall be no direct outfall into the water resource, and any resulting outfall shall not have an erosive effect on the WRA or diminish the stability of slopes; and
- d. There are no reasonable alternatives available.

A geotechnical report may be required to make the determination regarding slope stability.

**Finding:** Per City specifications, no stormwater detention or treatment is required as part of this development proposal.

3. Roadside storm water conveyance swales and ditches may be extended within rights-of-way located in a WRA. When possible, they shall be located along the side of the road furthest from the water resource. If the conveyance facility must be located along the side of the road closest to the water resource, it shall be located as close to the road/sidewalk as possible and include habitat friendly design features (treatment train, rain gardens, etc.).

**Finding:** There are no roadside stormwater conveyance swales or ditches proposed as part of this submittal.

4. Storm water detention and/or treatment facilities in the WRA shall be designed without permanent perimeter fencing and shall be landscaped with native vegetation.

**Finding:** There is not a formal stormwater detention or treatment facility proposed as part of this application. Regardless, there is no permanent fencing proposed, and as discussed previously, the applicant is providing an extensive landscaping plan with native vegetation.

5. Access to public storm water detention and/or treatment facilities shall be provided for maintenance purposes. Maintenance driveways shall be constructed to minimum width and use water permeable paving materials. Significant trees, including roots, shall not be disturbed to the degree possible. The encroachment and any tree loss shall be mitigated per CDC [32.090](#). There shall also be no adverse impacts upon the hydrologic conditions of the site.

**Finding:** There is not a public storm water detention or treatment facility required or provided as part of this application.

6. Storm detention and treatment and geologic hazards. Per the submittals required by CDC [32.050\(F\)\(3\)](#) and [92.010\(E\)](#), all proposed storm detention and treatment facilities must comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards, there will be no adverse off-site impacts caused by the development (including impacts from increased intensity of runoff downstream or constrictions causing ponding upstream), and the applicant must provide sufficient factual data to support the conclusions of the submitted plan.

**Finding:** There is not a storm water detention or treatment facility required or provided as part of this application.

C. *Repealed by Ord. [1647](#).*

D. WRA width. Except for the exemptions in CDC [32.040](#), applications that are using the alternate review process of CDC [32.070](#), or as authorized by the approval authority consistent with the provisions of this chapter, all development is prohibited in the WRA as established in Table 32-2 below:

Table 32-2. Required Width of WRA

Protected WRA Resource (see Chapter 2 CDC, Definitions)	Slope Adjacent to Protected Water Resource <sup>1,3</sup>	Starting Point for Measurements from Water Resource <sup>1,3</sup>	Width of WRA on Each Side of the Water Resource
A. Water Resource	0% - 25%	OHW or delineated edge of wetland	65 feet
B. Water Resource (Ravine)	over 25% to a distinct top of slope <sup>2</sup>	OHW or delineated edge of wetland	From water resource to top of slope <sup>2</sup> (30-foot minimum), plus an additional 50 feet <sup>4</sup>
C. Water Resource	Over 25% for more than 30 feet, and no distinct top of slope for at least 150 feet	OHW or delineated edge of wetland	200 feet
D. Riparian Corridor	Any	OHW	100 feet
E. Formerly Closed Drainage Channel Reopened	Any	OHW	15 feet
F. Ephemeral Stream	Any	Stream thread or centerline	15 feet with treatment or vegetation (see CDC 32.050(G)(1))
G. Fish Bearing Streams per Oregon Department of Fish and Wildlife (ODFW) or 2003-2004 Survey	Applies to all that stream section where fish were inventoried and upstream to the first known barrier to fish passage.	OHW or delineated edge of wetland	100 feet when no greater than 25% slope. See B or C above for steeper slopes
H. Re-aligned Water Resource	See A, B, C, D, F, or G, above	OHW or delineated edge of wetland	See A, B, C, D, F, or G, above

<sup>1</sup> The slope is the average slope in the first 50 feet as measured from bankfull stage or OHW.

<sup>2</sup> Where the protected water resource is confined by a ravine or gully, the top of slope is the location (30-foot minimum) where the slope breaks to less than 15 percent for at least 50 feet.

<sup>3</sup> At least three slope measurements along the water resource, at no more than 100-foot increments, shall be made for each property for which development is proposed. Depending upon topography, the width of the protected corridor may vary.

<sup>4</sup> The 50-foot distance may be reduced to 25 feet if a geotechnical study by a licensed engineer or similar accredited professional demonstrates that the slope is stable and not prone to erosion.

**Finding:** Trillium Creek is considered a riparian corridor, and per CDC 32.060(D), a 100-foot setback from the ordinary highwater mark is required. As noted previously, the entire site is located within the WRA setback area. Therefore, we are using the alternative review process offered in Section 32.070.

CDC Chapter 32 regulates work in Water Resource Areas (WRA). CDC Chapter 2 defines WRA's as "Any water resource or riparian area identified in the West Linn WRA Map and the adjacent area of varying widths, established pursuant to Chapter 32 CDC, in which development activities are restricted in order to

protect the functions and values of the associated water resource.” Based on this definition, and further guidance in the CDC, the WRA consists of the water resource (e.g., wetland or stream) and an associated buffer that varies in width depending on slope steepness (e.g., less than or greater than 25% slope), fish presence, and other potential factors per Table 32-2 of the CDC. Buffer widths can range between 65 and 200 feet, except for ephemeral streams that can have a minimum width of 15 feet. The minimum width for a riparian corridor starts at 100 feet regardless of slope.

As noted in the Calaroga Pump Station Natural Resources Site Review Memorandum (DEA 2023), no wetlands were present on-site or adjacent to the subject tax lot, but a perennial stream does run along the north property boundary.

## 32.070 ALTERNATE REVIEW PROCESS

This section establishes a review and approval process that applicants can use when there is reason to believe that the width of the WRA prescribed under the standard process (CDC [32.060\(D\)](#)) is larger than necessary to protect the functions of the water resource at a particular site. It allows a qualified professional to determine what water resources and associated functions (see Table 32-4 below) exist at a site and the WRA width that is needed to maintain those functions. (Ord. [1623 § 1](#), 2014)

**Finding:** *The Calaroga Pump Station Natural Resources Site Review Memorandum* (DEA 2023) documents the WRA, associated functions and WRA width needed to maintain those functions. The memorandum was prepared by a professional ecologist from David Evans and Associates, Inc. Responses to the West Linn CDC approval criteria of Section 32.080 are based on information from the Natural Resources Site Review Memorandum.

### 2.3.1 32.080 APPROVAL CRITERIA (ALTERNATE REVIEW PROCESS)

Applications reviewed under the alternate review process shall meet the following approval criteria:

A. The proposed WRA shall be, at minimum, qualitatively equal, in terms of maintaining the level of functions allowed by the WRA standards of CDC [32.060\(D\)](#).

**Finding:** The property is designated as a Significant Riparian Corridor on the West Linn Water Resource Area Map. Table 32-2, Required Width of WRA, indicates that the WRA width for Significant Riparian Corridors is 100 feet as measured from the ordinary high water (OHW). West Linn CDC defines a riparian corridor as an area within and adjacent to a WRA providing vegetative, forested and habitat values. In consideration of the above information from the West Linn CDC, the proposed WRA shall maintain vegetative, forested and habitat values within the on-site WRA.

The pump station will be re-located along the southern property boundary and within existing unimproved right-of-way to minimize impacts to Trillium Creek. **Table 1** summarizes the mitigation activities as compared with WRA functional values. The mitigation activities will improve the level of habitat and vegetative functions compared with the existing site conditions. Forested functional values will improve as replanted native trees grow to maturity.

Table 1. Summary of Existing and Proposed Conditions Compared with West Linn CDC Table 32-4 Ecological Functions of WRA

Ecological Function	Landscape Features Potentially Providing the Function	Existing Conditions	Proposed Enhanced Conditions
Stream flow moderation and/or water storage	A wetland or other water body with a hydrologic connection to a stream or flood area, the presence of fallen trees and density of vegetation in the WRA that slows the flow of storm water and increases its ability to retain sediment and infiltrate storm water, and the porosity of the WRA's surface to enable it to infiltrate storm water.	No wetlands or other water body is present other than Trillium Creek. Existing pavement increases direct runoff to the stream. This is offset to a degree by existing canopy cover. Presence of invasive English ivy and Himalayan blackberry on subject property is stressing existing vegetation and could eventually reduce the health and canopy cover, thereby adversely affecting this function. Adjacent property consists of blackberry thicket (i.e., little canopy cover).	Replacement of the ivy and blackberry with native shrubs and trees will increase canopy cover which will help moderate runoff and allow for more infiltration. Ivy and blackberry stressors will be removed.
Sediment or pollution control	Vegetation within 100 feet of a WRA on gentle slopes and up to 200 feet of a WRA if the slope is greater than 25%. The presence of fallen trees and other material that slows the flow of water and increase the ability to retain sediment, absorb pollutants and infiltrate storm water; the composition and density of vegetation; slope; and soils.	Current ground cover is minimal, with a high percent of bare ground under the existing canopy on the subject property. Canopy cover on adjacent lot is lacking. These factors result in greater potential for sediment runoff. However, erosion was not observed.	The mitigation plan proposes planting a variety and density of plants compared with existing conditions. Canopy cover overall will be increased. This will help prevent erosion and retain sediment and slow the flow of storm water.
Bank stabilization	Root masses, existing large rocks or anchored large wood along the stream bank.	The existing bank appears stable. Several grade control weirs occur in the stream, which help to reduce bank erosion. Riparian vegetation along the bank is fairly limited due to the adjacent driveway. The adjacent property has some native shrubs directly along the bank but only invasive blackberry just back from the bank.	Construction work areas will avoid existing native vegetation along the banks. Invasive plants near the streambank will be removed by hand and exposed soils will be replanted with native shrubs and trees and temporarily stabilized with jute matting.
Large wood recruitment for a fish bearing section of stream	Forest canopy within 50 to 150 feet of a fish bearing stream.	A few large trees within the subject property occur directly along the bank. All other trees are relatively small and/or have been topped due to power line maintenance. Thus, existing large wood recruitment from the subject and adjacent properties is fairly limited.	The West Linn WRA Map shows Trillium Creek as a fish-bearing stream within the study area. Oregon Department of Fish and Wildlife maps the creek as fish bearing up to the Calaroga Drive culvert crossing. Six trees beyond 25 feet from the creek will be removed from the proposed development footprint and replanted. Existing trees to remain will continue to provide forest canopy within 50 feet of the stream. Forest canopy will

Ecological Function	Landscape Features Potentially Providing the Function	Existing Conditions	Proposed Enhanced Conditions
			increase as mitigation trees grow to maturity.
Organic material sources	Forest canopy or woody vegetation within 100 feet of a water resource; or within a flood area.	Canopy coverage is high on the subject parcel and absent on the adjacent parcel.	See Large Wood Recruitment above.
Shade (water temperature moderation) and microclimate	Forest canopy or woody vegetation within 100 feet of the water resource. Roughly 300 feet of continuous canopy for microclimate.	See Organic Material Sources above.	See Large Wood Recruitment above.
Stream flow that sustains in-stream and adjacent habitats	Seasonal or perennial flow.	Trillium creek is a perennial creek.	The project design includes use of gabion walls and porous rock that will allow rainfall to infiltrate into the ground and sustain in-stream and adjacent habitats.
Other terrestrial habitat	Forest canopy natural vegetation contiguous to and within 100 to 300 feet of the water resource.	Site has high canopy coverage but is developed (paved) and/or has high percentage of invasives in the understory.	The site will be enhanced with native riparian forest plantings supporting terrestrial habitat.

B. If a WRA is already significantly degraded (e.g., native forest and ground cover have been removed or the site dominated by invasive plants, debris, or development), the approval authority may allow a reduced WRA in exchange for mitigation, if:

1. The proposed reduction in WRA width, coupled with the proposed mitigation, would result in better performance of functions than the standard WRA without such mitigation. The approval authority shall make this determination based on the applicant’s proposed mitigation plan and a comparative analysis of ecological functions under existing and enhanced conditions (see Table 32-4).
2. The mitigation project shall include all of the following components as applicable. It may also include other forms of enhancement (mitigation) deemed appropriate by the approval authority.
  - a. Removal of invasive vegetation.
  - b. Planting native, non-invasive plants (at minimum, consistent with CDC [32.100](#)) that provide improved filtration of sediment, excess nutrients, and pollutants. The amount of enhancement (mitigation) shall meet or exceed the standards of CDC [32.090\(C\)](#).
  - c. Providing permanent improvements to the site hydrology that would improve water resource functions.
  - d. Substantial improvements to the aquatic and/or terrestrial habitat of the WRA.

C. Identify and discuss site design and methods of development as they relate to WRA functions.

**Finding:** As described in the attached Natural Resources Site Review Memorandum, the subject tax lot and adjacent off-site areas were reviewed for the potential presence of regulated wetlands and waterways during the 2021 investigation period. Adjacent off-site areas were visually inspected from the subject parcel and the public right of way due to lack of access. The 2021 review determined that no wetlands were present on-site or adjacent to the subject tax lot. A perennial stream (Trillium Creek) flows along the western and north property boundaries.

The property is entirely within the first 50 feet of the WRA as measured perpendicular from OHW to the southwest property corner. Existing development on the property consists of the pump station and paved maintenance access driveway and accounts for 0.02 acres of the 0.08-acre on-site WRA (acreage includes the property and the portion of unimproved right-of-way within the project area). The off-site portion of the 100-foot wide WRA extends into improved road right-of-way and adjacent residential properties.

Areas bordering the developed portion of the site contain a mix of native and non-native riparian vegetation. Native vegetation consists of an overstory of black cottonwood (*Populus balsamifera*), and red alder (*Alnus rubra*), with red cedar (*Thuja plicata*) observed nearby. Native understory consists of sword fern (*Polystichum munitum*). Non-native species consist of English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus armeniacus*). The ivy was mixed in with native vegetation and predominantly found along the edges of the access driveway and Calaroga Drive. The blackberry primarily occurred as a large patch along the east and south sides of the pump station.

The existing WRA can be considered degraded given the existing developed conditions and presence of non-native species. Table 1 compares the existing and proposed conditions relative to functional values.

CDC 32.090(B and C) specifies a preference for on-site mitigation and requires a mitigation ratio for impacts to non-previously disturbed buffer of one square foot of mitigation for every square foot of impact. The project is proposing on-site mitigation in the form of enhancement along the east side of the property where no development is proposed. This is shown on Figure the attached plan set, Sheet 20, Planting Plan (Drawing L01), and Sheet 21 (Drawing L02), Planting Details. This area contains a large patch of invasive Himalayan blackberry that will be removed and enhanced with native riparian forest plantings. The area of mitigation is a total of 4,046 square feet, which is based on the ratios provided in accordance with CDC 32.100 Revegetation Plan Requirements.

**D. Address the approval criteria of CDC 32.060, with the exception of CDC 32.060(D).**

**Finding:** CDC 32.060 approval criteria and applicant responses are provided in a preceding section. As addressed elsewhere, this criterion is met.

## 32.090 MITIGATION PLAN

**A** A mitigation plan shall only be required if development is proposed within a WRA (including development of a Previously Disturbed Area (PDA)). (Exempted activities of CDC 32.040 do not require mitigation unless specifically stated. Temporarily disturbed areas, including TDAs associated with exempted activities, do not require mitigation, just grade and soil restoration and re-vegetation.) The mitigation plan shall satisfy all applicable provisions of CDC 32.100, Re-Vegetation Plan Requirements.

**B.** Mitigation shall take place in the following locations, according to the following priorities (subsections (B)(1) through (4) of this section):



1. On-site mitigation by restoring, creating or enhancing WRAs.
2. Off-site mitigation in the same sub-watershed will be allowed, but only if the applicant has demonstrated that:
  - a. It is not practicable to complete mitigation on-site, for example, there is not enough area on-site; and
  - b. The mitigation will provide equal or superior ecological function and value.
3. Off-site mitigation outside the sub-watershed will be allowed, but only if the applicant has demonstrated that:
  - a. It is not practicable to complete mitigation on-site, for example, there is not enough area on-site; and
  - b. The mitigation will provide equal or superior ecological function and value.
4. Purchasing mitigation credits through DSL or other acceptable mitigation bank.

**Finding:** As noted previously, the existing WRA can be considered degraded given the existing developed conditions and presence of non-native species. CDC 32.090(B and C) specifies a preference for on-site mitigation and requires a mitigation ratio for impacts to non-previously disturbed buffer of one square foot of mitigation for every square foot of impact. The project is proposing on-site mitigation in the form of enhancement along the east side of the property where no development is proposed. This is shown on Figure the attached plan set, Sheet 20, Planting Plan (Drawing L01), and Sheet 21 (Drawing L02), Planting Details. This area contains a large patch of invasive Himalayan blackberry that will be removed and enhanced with native riparian forest plantings.

Proposed mitigation is shown on the attached Planting Plan design sheets (L01 and L02). The required minimum area of mitigation, based on the CDC mitigation ratio, is 1,223 sq. ft. (0.5 x 2,445 sq ft of impact). However, due to the CDC tree and shrub quantity and spacing requirements, an additional 464 sq. ft. of planting area is required to accommodate all plantings. Therefore, the total proposed mitigation area is 1,697 sq. ft, which includes 858 sq. ft. on the subject parcel and 839 sq. ft. on the adjacent parcel (with the property owner's permission). Proposed mitigation design is attached and has been prepared in accordance with CDC 32.100 Revegetation Plan Requirements.

**C. Amount of mitigation.**

1. The amount of mitigation shall be based on the square footage of the permanent disturbance area by the application. For every one square foot of non-PDA disturbed area, on-site mitigation shall require one square foot of WRA to be created, enhanced or restored.
2. For every one square foot of PDA that is disturbed, on-site mitigation shall require one half a square foot of WRA vegetation to be created, enhanced or restored.

3. For any off-site mitigation, including the use of DSL mitigation credits, the requirement shall be for every one square foot of WRA that is disturbed, two square feet of WRA shall be created, enhanced or restored. The DSL mitigation credits program or mitigation bank shall require a legitimate bid on the cost of on-site mitigation multiplied by two to arrive at the appropriate dollar amount.

**Finding:** The proposed planting plan provides the following:

Native Trees And Shrubs are required to be planted at a rate of five trees and 25 shrubs per every 500 square feet of disturbance area:

- Total Disturbance Area = 2,445 Sf
- Required Trees = 24 Trees
- $2,445 \text{ Sf} / 500 \text{ Sf} = 4.89 \times 5 \text{ Trees} = 24.45 \text{ Trees}$
- Required Shrubs = 122 Shrubs
- $2,445 \text{ Sf} / 500 \text{ Sf} = 4.89 \times 25 \text{ Shrubs} = 122.25 \text{ Shrubs}$

Our plans provide a combination of plantings, including Vine Maple, Bigleaf Maple, Read Alder, and Western Red Cedar. Shrubs and groundcover include combinations of Western Sword Ferns, Red Elderberry, and Common Snowberry, with a native seed mix.

D. The Planning Director may limit or define the scope of the mitigation plan and submittal requirements commensurate with the scale of the disturbance relative to the resource and pursuant to the authority of Chapter 99 CDC. The Planning Director may determine that a consultant is required to complete all or a part of the mitigation plan requirements.

E. A mitigation plan shall contain the following information:

1. A list of all responsible parties including, but not limited to, the owner, applicant, contractor, or other persons responsible for work on the development site.
2. A map showing where the specific adverse impacts will occur and where the mitigation activities will occur.
3. A re-vegetation plan for the area(s) to be mitigated that meets the standards of CDC 32.100.
4. An implementation schedule, including timeline for construction, mitigation, mitigation maintenance, monitoring, and reporting. All in-stream work in fish bearing streams shall be done in accordance with the Oregon Department of Fish and Wildlife.
5. Assurances shall be established to rectify any mitigation actions that are not successful within the first three years. This may include bonding or other surety. (Ord. 1623 § 1, 2014)

**Finding:** Additional off-site mitigation required by the Director will be finalized prior to final building occupancy permits. The total proposed mitigation area is 1,697 sq. ft, which includes 858 sq. ft. on the subject parcel and 839 sq. ft. on the adjacent parcel (with the property owner's permission). Proposed

mitigation design is attached and has been prepared in accordance with CDC 32.100 Revegetation Plan Requirements.

## 32.100 RE-VEGETATION PLAN REQUIREMENTS

A. In order to achieve the goal of re-establishing forested canopy, native shrub and ground cover and to meet the mitigation requirements of CDC [32.090](#) and vegetative enhancement of CDC [32.080](#), tree and vegetation plantings are required according to the following standards:

1. All trees, shrubs and ground cover to be planted must be native plants selected from the Portland Plant List.
2. Plant size. Replacement trees must be at least one-half inch in caliper, measured at six inches above the ground level for field grown trees or above the soil line for container grown trees (the one-half inch minimum size may be an average caliper measure, recognizing that trees are not uniformly round), unless they are oak or madrone which may be one gallon size. Shrubs must be in at least a one-gallon container or the equivalent in ball and burlap and must be at least 12 inches in height.
3. Plant coverage.
  - a. Native trees and shrubs are required to be planted at a rate of five trees and 25 shrubs per every 500 square feet of disturbance area (calculated by dividing the number of square feet of disturbance area by 500, and then multiplying that result times five trees and 25 shrubs, and rounding all fractions to the nearest whole number of trees and shrubs; for example, if there will be 330 square feet of disturbance area, then 330 divided by 500 equals 0.66, and 0.66 times five equals 3.3, so three trees must be planted, and 0.66 times 25 equals 16.5, so 17 shrubs must be planted). Bare ground must be planted or seeded with native grasses or herbs. Non-native sterile wheat grass may also be planted or seeded, in equal or lesser proportion to the native grasses or herbs.
  - b. Trees shall be planted between eight and 12 feet on center and shrubs shall be planted between four and five feet on center, or clustered in single species groups of no more than four plants, with each cluster planted between eight and 10 feet on center. When planting near existing trees, the dripline of the existing tree shall be the starting point for plant spacing measurements.
4. Plant diversity. Shrubs must consist of at least two different species. If 10 trees or more are planted, then no more than 50 percent of the trees may be of the same genus.
5. Invasive vegetation. Invasive non-native or noxious vegetation must be removed within the mitigation area prior to planting.
6. Tree and shrub survival. A minimum survival rate of 80 percent of the trees and shrubs planted is expected by the third anniversary of the date that the mitigation planting is completed.

7. **Monitoring and reporting.** Monitoring of the mitigation site is the ongoing responsibility of the property owner. Plants that die must be replaced in kind.
  
8. To enhance survival of tree replacement and plantings, the following practices are required:
  - a. **Mulching.** Mulch new plantings a minimum of three inches in depth and 18 inches in diameter to retain moisture and discourage weed growth.
  
  - b. **Irrigation.** Water new plantings one inch per week between June 15th to October 15th, for the three years following planting.
  
  - c. **Weed control.** Remove, or control, non-native or noxious vegetation throughout maintenance period.
  
  - d. **Planting season.** Plant bare root trees between December 1st and February 28th, and potted plants between October 15th and April 30th.
  
  - e. **Wildlife protection.** Use plant sleeves or fencing to protect trees and shrubs against wildlife browsing and resulting damage to plants.

B. When weather or other conditions prohibit planting according to schedule, the applicant shall ensure that disturbed areas are correctly protected with erosion control measures and shall provide the City with funds in the amount of 125 percent of a bid from a recognized landscaper or nursery which will cover the cost of the plant materials, installation and any follow up maintenance. Once the planting conditions are favorable the applicant shall proceed with the plantings and receive the funds back from the City upon completion, or the City will complete the plantings using those funds. (Ord. [1623](#) § 1, 2014)

**Finding:** The proposed planting plan provides the following:

Native Trees And Shrubs are required to be planted at a rate of five trees and 25 shrubs per every 500 square feet of disturbance area:

- Total Disturbance Area = 2,445 Sf
- Required Trees = 24 Trees
- $2,445 \text{ Sf} / 500 \text{ Sf} = 4.89 \times 5 \text{ Trees} = 24.45 \text{ Trees}$
- Required Shrubs = 122 Shrubs
- $2,445 \text{ Sf} / 500 \text{ Sf} = 4.89 \times 25 \text{ Shrubs} = 122.25 \text{ Shrubs}$

Our plans provide a combination of plantings, including Vine Maple, Bigleaf Maple, Read Alder, and Western Red Cedar. Shrubs and groundcover include combinations of Western Sword Ferns, Red Elderberry, and Common Snowberry, with a native seed mix. Existing trees to remain will continue to provide forest canopy within 50 feet of the stream. Forest canopy will increase as mitigation trees grow to maturity.

Within the attached Plan Set, planting specifications are provided which detail the amount of mulch, planting installation, and other specifications to ensure survival of the vegetation. The applicant

understands the responsibility to provide maintenance to ensure landscape viability and will make every effort to ensure planting is sustainable, understanding replacements may need to be made over time.

## 2.4 Chapter 55: Design Review

### 55.010 PURPOSE AND INTENT – GENERAL

The purpose of the design review provisions is to establish a process and standards for the review of development proposals in order to conserve and enhance the appearance of the City and to promote functional, safe, and innovative site development. Attention will be paid to the proposal's scale, layout and design, its compatibility with the surrounding natural environment, and the character of the surrounding neighborhood or area. The intent is to ensure that there is general compatibility between adjoining uses, that private and common outdoor space is provided, that vehicular access and circulation are safe, and that areas of public use are made aesthetically attractive and safe. Also of concern are the needs of persons with disabilities.

Developers of multi-family, industrial, commercial, office, and public building projects are required to take steps to reduce reliance on the automobile by, in part, encouraging other modes of transportation such as transit, bicycles, and foot traffic, and through building orientation or location. (Ord. 1650 § 1 (Exh. A), 2016)

### 55.020 CLASSES OF DESIGN REVIEW

A. Class I Design Review. The following are subject to Class I Design Review:

[...]

5. Minor modifications and/or upgrades of pump stations, reservoirs, and storm detention facilities.

[...]

**Finding:** The proposed use is considered an upgrade of a pump station and is therefore subject to the requirements of Class I Design Review as described in CDC 55.020(A)(5).

### 55.025 EXEMPTIONS

The following activities are exempt from the provisions of this chapter:

- A. Detached single-family residential construction, except as indicated otherwise in the base zone or this chapter;
- B. Accessory structures;
- C. Single-family attached structures except as indicated otherwise in the base zone or this chapter;
- D. Architectural replacements in kind, or replacement of building materials that are equal or superior to existing materials (in terms of performance or quality) but that do not alter the architectural style of the structure. Retrofitted awnings, changes in color schemes, wall art, and freestanding statuary or art under five feet tall are exempt from design review, but shall be subject to Planning Director review under the

provisions of CDC 99.060(A)(2), prescribed conditions, and the approval criteria of CDC 55.100(B)(6)(a) and (b). (Ord. 1408, 1998; Ord. 1604 § 51, 2011; Ord. 1675 § 43, 2018; Ord. 1736 § 1 (Exh. A), 2022)

**Finding:** The proposed relocated pump station and improvements will add improvements to the parcel, and the use does not meet the criteria for an exemption from the Chapter 55 standards.

## 55.030 ADMINISTRATION AND APPROVAL PROCESS

A. A pre-application conference is required before submitting a development plan application for design review as provided by CDC 99.030(B).

B. The application shall be submitted by the record owner(s) of the property, authorized agent, or condemnor.

C. Action on the development plan application shall be as provided by Chapter 99 CDC, Procedures for Decision-Making: Quasi-Judicial, and the following:

1. The Planning Director for Class I design review applications, or Planning Commission for Class II design review applications, shall approve, approve with conditions, or deny the application based on findings related to the applicable criteria set forth in CDC 99.110 and this chapter.

2. A decision by the Planning Director may be reviewed by the City Council.

D. Substantial modifications made to the approved development plan will require reapplication (e.g., more or fewer lots, different architectural design, etc.). (Ord. 1474, 2001; Ord. 1597 § 14, 2010)

**Finding:** A preapplication conference, for project file #PA-23-04, was held on March 2, 2023, with the West Linn Planning Department, which confirmed that the proposal would be processed through a Class I Design Review procedure. The City of West Linn has authorized this submittal.

## 55.040 EXPIRATION OR EXTENSION OF APPROVAL

If substantial construction has not occurred within three years from the date of approval of the development plan, the approved proposal will be void, unless an extension is granted under CDC 99.325. (Ord. 1408, 1998; Ord. 1589 § 1 (Exh. A), 2010)

**Finding:** The applicant understands the expiration date of land use approval and will comply with the requirements of CDC 55.040.

## 55.050 DESIGN REVIEW AMENDMENT TRIGGER

Amendments to design review shall be required when 10 percent or more of the housing type changes (e.g., from single-family units to multi-family units) from the tentatively approved design review plan, or when there is more than a 10 percent change in the number of units, or when the layout of streets and lots significantly changes, or adjusting more than 20 percent of the building footprint or site plan, or significant changes to the architecture that modify the style, mass, or result in elimination of significant design features. Changes in color or materials would not require an amendment unless the colors were non-earth tones and the materials were of poorer quality (for example, going from tile roof to

composition roofing) than originally approved. Changes to the project/site plan to meet conditions of approval or legislative changes shall not trigger an amendment. (Ord. 1408, 1998)

**Finding:** The proposed project is not a residential housing use, and the Design Review Amendment triggers do not apply to the proposal.

## 55.060 STAGED OR PHASED DEVELOPMENT

The applicant may elect to develop the site in stages. Staged development shall be subject to the provisions of CDC 99.125.

**Finding:** At this time, the applicant is not intending to develop the project in stages but is aware of the requirements of CDC 99.125.

## 55.070 SUBMITTAL REQUIREMENTS

- A. The design review application shall be initiated by the property owner or the owner's agent, or condemnor.
  - B. A pre-application conference, per CDC 99.030(B), shall be a prerequisite to the filing of an application.
  - C. Documentation of any required meeting with the respective City-recognized neighborhood association per CDC 99.038.
  - D. The applicant shall submit a completed application form and:
    - 1. The development plan for a Class I design review shall contain the following elements:
      - a. A site analysis (CDC 55.110) only if the site is undeveloped;
      - b. A site plan (CDC 55.120);
      - c. Architectural drawings, including building envelopes and all elevations (CDC 55.140) only if architectural work is proposed; and
      - d. Pursuant to CDC 55.085, additional submittal material may be required. One original application form must be submitted. One copy at the original scale and one copy reduced to 11 inches by 17 inches or smaller of all drawings and plans must be submitted. One copy of all other items must be submitted. The applicant shall also submit one copy of the complete application in a digital format acceptable to the City. When the application submittal is determined to be complete, additional copies may be required as determined by the Community Development Department.
- [...]
- 3. A narrative, based on the standards contained in this code, which supports any requested exceptions as provided under CDC 55.170.

4. Submit full written responses to approval criteria of [...] CDC 55.090 for Class I design review, plus all applicable referenced approval criteria.

E. The applicant shall submit samples of all exterior building materials and colors in the case of new buildings or building remodeling.

F. The applicant shall pay the required deposit and fee. (Ord. 1401, 1997; Ord. 1408, 1998; Ord. 1442, 1999; Ord. 1613 § 11, 2013; Ord. 1621 § 25, 2014; Ord. 1622 § 14, 2014)

**Finding:** The applicant acknowledges the City's submittal requirements and is complying by submitting this application.

## 55.085 ADDITIONAL INFORMATION REQUIRED AND WAIVER OF REQUIREMENTS

A. The Planning Director may require additional information as part of the application subject to the provisions of CDC 99.035(A).

B. The Planning Director may waive any requirements for the application subject to the provisions of CDC 99.035(B) and (C).

**Finding:** The applicant understands the authority of the Planning Director to require additional information as part of an application, or to waive certain requirements.

## 55.090 APPROVAL STANDARDS – CLASS I DESIGN REVIEW

The Planning Director shall make a finding with respect to the following criteria when approving, approving with conditions, or denying a Class I design review application:

A. The provisions of the following sections shall be met:

1. CDC [55.100](#)(B)(1) through (4), Relationship to the natural and physical environment, shall apply except in those cases where the proposed development site is substantially developed and built out with no remaining natural physical features that would be impacted.

**Finding:** The proposal's compliance with CDC 55.100(B)(1) through (4) is addressed in the following sections.

2. CDC [55.100](#)(B)(5) and (6), architecture, et al., shall only apply in those cases that involve exterior architectural construction, remodeling, or changes.

**Finding:** There is no architectural construction, remodeling, or changes to the existing development, other than demolition. CDC 55.090(A)(2) does not apply to the proposal.

3. Pursuant to CDC [55.085](#), the Director may require additional information and responses to additional sections of the approval criteria of this section depending upon the type of application.

4. The design standards or requirements identified in the base zone shall apply.



**Finding:** The applicant acknowledges the requirements of the R-15 zoning district and has detailed compliance with the design standards of this zoning district throughout this submittal.

**B. An application may be approved only if adequate public facilities will be available to provide service to the property at the time of occupancy.**

**Finding:** Adequate public facilities- including water, sanitary sewer, electricity, and other required infrastructure are available to serve the new pump station. The services exist now, and the proposed project will not cause an expansion of the use or require additional public facilities.

**C. The Planning Director shall determine the applicability of the approval criteria in subsection A of this section. (Ord. [1408](#), 1998; Ord. [1544](#), 2007; Ord. [1675](#) § 44, 2018)**

**Finding:** In consultation with the Planning Director during the pre-application process, it was confirmed that the project would need to comply with the requirements of Class I Design Review and the proposal's relationship with the natural environment, as described in the following section.

## 55.100 APPROVAL STANDARDS – CLASS II DESIGN REVIEW (COMPLIANCE WITH 55.100(B)(1) through (4))

**B. Relationship to the natural and physical environment.**

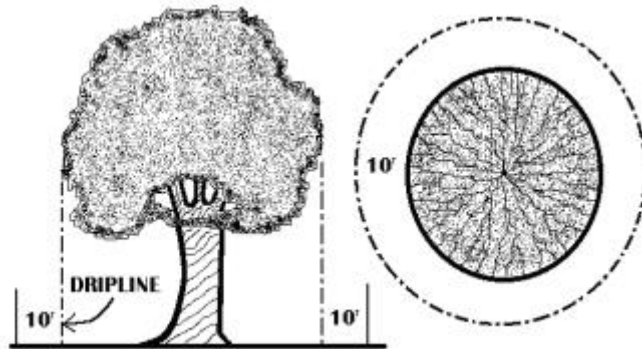
1. The buildings and other site elements shall be designed and located so that all heritage trees, as defined in the municipal code, shall be saved. Diseased heritage trees, as determined by the City Arborist, may be removed at their direction.

**Finding:** There are no heritage trees as defined in the City of West Linn Municipal Code on the site.

2. All heritage trees, as defined in the municipal code, all trees and clusters of trees ("cluster" is defined as three or more trees with overlapping driplines; however, native oaks need not have an overlapping dripline) that are considered significant by the City Arborist, either individually or in consultation with certified arborists or similarly qualified professionals, based on accepted arboricultural standards including consideration of their size, type, location, health, long term survivability, and/or numbers, shall be protected pursuant to the criteria of subsections (B)(2)(a) through (f) of this section. In cases where there is a difference of opinion on the significance of a tree or tree cluster, the City Arborist's findings shall prevail. It is important to acknowledge that all trees are not significant and, further, that this code section will not necessarily protect all trees deemed significant.

**Finding:** A group of 6 trees will be removed to provide a buildable area above the 100-year flood elevation for the gabion wall, which will provide a necessary support for the new wet wall and vault, considered to be Critical Infrastructure. A replanting plan has been proposed with native trees, shrubs, and seed, to provide suitable vegetation over the development area.

a. Non-residential and residential projects on Type I and II lands shall protect all heritage trees and all significant trees and tree clusters by limiting development in the protected area. The protected area includes the protected tree, its dripline, and an additional 10 feet beyond the dripline, as depicted in the figure below. Development of Type I and II lands shall require the careful layout of streets, driveways, building pads, lots, and utilities to avoid heritage trees and significant trees and tree clusters, and other natural resources pursuant to this code. The method for delineating the protected trees or tree clusters (“dripline plus 10 feet”) is explained in subsection (B)(2)(b) of this section. Exemptions of subsections (B)(2)(c), (e), and (f) of this section shall apply.



PROTECTED AREA = DRIPLINE + 10 FEET

**Finding:** The entire site is considered to be Type I lands according to the CDC. As noted previously, it is not practical given the size and physical limitations of the site to retain all of the trees. A replanting plan has been proposed with native trees, shrubs, and seed, to provide suitable vegetation over the development area.

b. Non-residential and residential projects on non-Type I and II lands shall set aside up to 20 percent of the protected areas for significant trees and tree clusters, plus any heritage trees. Therefore, in the event that the City Arborist determines that a significant tree cluster exists at a development site, then up to 20 percent of the non-Type I and II lands shall be devoted to the protection of those trees by limiting development in the protected areas. The exact percentage is determined by establishing the driplines of the trees or tree clusters that are to be protected. In order to protect the roots which typically extend further, an additional 10-foot measurement beyond the dripline shall be added. The square footage of the area inside this “dripline plus 10 feet” measurement shall be the basis for calculating the percentage (see figure below). The City Arborist will identify which tree(s) are to be protected. Development of non-Type I and II lands shall also require the careful layout of streets, driveways, building pads, lots, and utilities to avoid significant trees, tree clusters, heritage trees, and other natural resources pursuant to this code. Exemptions of subsections (B)(2)(c), (e), and (f) of this section shall apply. Please note that in the event that more than 20 percent of the non-Type I and II lands comprise significant trees or tree clusters, the developer shall not be required to save the excess trees, but is encouraged to do so.

**Finding:** The site is considered to be Type I lands so this criteria is not applicable.

c. Where stubouts of streets occur on abutting properties, and the extension of those streets will mean the loss of significant trees, tree clusters, or heritage trees, it is understood that tree loss may be inevitable. In these cases, the objective shall be to minimize tree loss. These provisions shall also apply in those cases where access, per construction code standards, to a lot or parcel is blocked by a row or screen of significant trees or tree clusters.

**Finding:** The proposal does not involve construction or extension of a street, so the standards of CDC 55.100(B)(2)(c) do not apply to the project.

d. For both non-residential and residential development, the layout shall achieve at least 70 percent of maximum density for the developable net area. The developable net area excludes all Type I and II lands and up to 20 percent of the remainder of the site for the purpose of protection of stands or clusters of trees as defined in subsection (B)(2) of this section.

**Finding:** The entire site is considered to be Type I and II lands, and so is exempt from the density requirement in CDC 55.100(B)(2)(d).

e. For arterial and collector street projects, including Oregon Department of Transportation street improvements, the roads and graded areas shall avoid tree clusters where possible. Significant trees, tree clusters, and heritage tree loss may occur, however, but shall be minimized.

**Finding:** The proposal does not include an arterial or collector street project, so this criterion is not applicable.

f. If the protection of significant tree(s) or tree clusters is to occur in an area of grading that is necessary for the development of street grades, per City construction codes, which will result in an adjustment in the grade of over or under two feet, which will then threaten the health of the tree(s), the applicant will submit evidence to the Planning Director that all reasonable alternative grading plans have been considered and cannot work. The applicant will then submit a mitigation plan to the City Arborist to compensate for the removal of the tree(s) on an "inch by inch" basis (e.g., a 48-inch Douglas fir could be replaced by 12 trees, each four-inch). The mix of tree sizes and types shall be approved by the City Arborist.

**Finding:** The applicant understands this requirement and will submit a mitigation plan to the City Arborist if determined to be necessary.

### 3. The topography and natural drainage shall be preserved to the greatest degree possible.

**Finding:** The applicant is preserving the bank from erosion and accommodating a natural drainage pattern by use of a gabion wall, which is essentially constructed with wire baskets of rock.

### 4. The structures shall not be located in areas subject to slumping and sliding. The Comprehensive Plan Background Report's Hazard Map, or updated material as available and as deemed acceptable by the Planning Director, shall be the basis for preliminary determination.

**Finding:** The NHMP provides the most current information regarding landslides and potential landslides. Map 11 identifies potential landslides, none of which are located on the subject property. Map 16 identifies areas vulnerable to landslides including portions of the subject property. Structures are proposed on these areas, and the structural integrity of the improvements proposed is addressed on page 44 of this application narrative, under findings for Site Analysis.

## 55.110 SITE ANALYSIS

The site analysis shall include:

- A. A vicinity map showing the location of the property in relation to adjacent properties, roads, pedestrian and bike ways, transit stops and utility access.
- B. A site analysis on a drawing at a suitable scale (in order of preference, one inch equals 10 feet to one inch equals 30 feet) which shows:
  1. The property boundaries, dimensions, and gross area.
  2. Contour lines at the following minimum intervals:
    - a. Two-foot intervals for slopes from zero to 25 percent; and
    - b. Five- or 10-foot intervals for slopes in excess of 25 percent.
  3. Tables and maps identifying acreage, location and type of development constraints due to site characteristics such as slope, drainage and geologic hazards, including a slope analysis which identifies portions of the site according to the land types (I, II, III and IV) defined in Chapter 02 CDC.
  4. The location and width of adjoining streets.
  5. The drainage patterns and drainage courses on the site and on adjacent lands.
  6. Potential natural hazard areas including:
    - a. Floodplain areas pursuant to the site's applicable FEMA Flood Map panel;

**Finding:** The subject property is within the 1996 Flood inundation area, as identified on the Flood Management Area map. See land use development plan set, Sheet 05, the attached Site Plan illustrates all natural resource overlays, physical features, and land types.

- b. Water resource areas as defined by Chapter 32 CDC;

**Finding:** See land use Plan Set Sheet 05, Site Plan.

- c. Landslide areas designated by the Natural Hazard Mitigation Plan, Map 16; and

**Finding:** Based on a review of the Potential Landslides Map 11 of the NHMP, there are no identified landslide areas on the subject property.

**d. Landslide vulnerable analysis areas, designated by the Natural Hazard Mitigation Plan, Map 17.**

**Finding:** The NHMP provides the most current information regarding landslides and potential landslides. Map 11 identifies potential landslides, none of which are located on the subject property. Map 16 identifies areas vulnerable to landslides including portions of the subject property. Structures are proposed on these areas. Geotechnical engineers Northwest Geotech, Inc. (NGI), provided a review (*Geotechnical Design Summary*, memo dated August 17, 2023, and accompanying *Geotechnical Data Report*) of the proposed gabion wall as a method to stabilize the bank and provide structural integrity for the new wet well and associated vault. The report found that the project area is mapped as Columbia River Basalt Group (CRBG) bedrock near the surface and adjacent stretches of the riverbank area show the Missoula Flood Deposits formation mantling the weathered basalt in the form of a bench. Site borings confirmed that the flood deposits are unsaturated and not prone to seismic liquefaction hazards. NGI recommended the use of a welded wire gabion retaining wall to laterally support the new pump station based on the following seismic and static slope stability considerations:

- 1). A gabion wall is generally self-draining, mitigating the primary hazard associated with a retaining wall in the flood zone. The primary hazard is hydrostatic pressure on the back side of a retaining wall during relatively rapid drawdown of flood water.
- 2). A gabion wall is one of the most resistant to overall slope stability hazards, as it forms a relatively large structural mass and wide base that forces any shear planes around it, thus providing a high factor of safety.
- 3). A gabion wall is flexible and can accommodate variable settlement conditions while maintaining all structural integrity.

NGI completed a Geotechnical Data Report (included in the project land use submittal) and found that the weathered basalt was highly fractured and is not anticipated to pose any significant difficulty during construction, while providing a stable wall support. The existing pump station is also embedded in the weathered basalt. The weathered basalt is exposed in the adjacent creek bed, and no on-going erosion is evident (creek is not anticipated to erode vertically in the future). As a result, and based on seismic slope stability studies and long-term groundwater level monitoring, NGI found that the proposed facility and gabion wall treatment are consistent with the intent and goals of the West Linn Natural Hazards Mitigation Plan.

[...]

**7. Resource areas including:**

- a. Wetlands;
- b. Riparian corridors;
- c. Streams, including intermittent and ephemeral streams;
- d. Habitat conservation areas; and
- e. Large rock outcroppings.

8. Potential historic landmarks and registered archaeological sites. The existence of such sites on the property shall be verified from records maintained by the Community Development Department and other recognized sources.

**Finding:** The City of West Linn Historic Resource Map, July 2015, identifies historic districts and landslides. The subject property is not identified as a historic resource on the Historic Resource Map. The nearest historic landmark is more than ½ mile from the site. A review of the Oregon State Historic Preservation Office Database and National Register of Historic Places Database found that there are no eligible/listed or eligible historic sites on or near the subject property. The nearest eligible historic site is just under a ½ mile from the subject property (3340 Arbor Drive).

9. Identification information including the name and address of the owner, developer, project designer, lineal scale and north arrow.

**Finding:** This information has been provided on the attached Plan Set.

10. Identify Type I and II lands in map form. Provide a table which identifies square footage of Type I and II lands also as percentage of total site square footage. (Ord. 1408, 1998; Ord. 1425, 1998; Ord. 1442, 1999; Ord. 1463, 2000; Ord. 1526, 2005; Ord. 1544, 2007; Ord. 1565, 2008; Ord. 1590 § 1, 2009; Ord. 1613 § 13, 2013; Ord. 1621 § 25, 2014; Ord. 1635 § 27, 2014; Ord. 1636 § 38, 2014; Ord. 1662 § 9, 2017)

**Finding:** This information has been provided on Sheet 07, in the attached Plan Set.

## 55.130 GRADING AND DRAINAGE PLANS

For Type I, II and III lands (refer to definitions in Chapter 02 CDC), a registered civil engineer must prepare a grading plan and a storm detention and treatment plan pursuant to CDC 92.010(E), at a scale sufficient to evaluate all aspects of the proposal, and a statement that demonstrates:

A. The location and extent to which grading will take place indicating general contour lines, slope ratios, slope stabilization proposals, and location and height of retaining walls, if proposed.

B. All proposed storm detention and treatment facilities comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards.

C. There is sufficient factual data to support the conclusions of the plan.

D. Per CDC 99.035, the Planning Director may require the information in subsections A, B and C of this section for Type IV lands if the information is needed to properly evaluate the proposed site plan.

E. For Type I, II and III lands (refer to definitions in Chapter 02 CDC), the applicant must provide a geologic report, with text, figures and attachments as needed to meet the industry standard of practice, prepared by a certified engineering geologist and/or a geotechnical professional engineer, that includes:

1. Site characteristics, geologic descriptions and a summary of the site investigation conducted;

2. Assessment of engineering geological conditions and factors;

3. Review of the City of West Linn’s Natural Hazard Mitigation Plan and applicability to the site; and

**Finding:** The Natural Hazard Mitigation Plan (NHMP) identifies the Calaroga Sewage Pump Station as critical infrastructure, defined as infrastructure that provides necessary services for emergency response. Table WL-6 lists the hazards that the Calaroga Pump Station may be exposed to, based on GIS analysis and knowledge of the Hazard Mitigation Advisory Committee (NHMP page WL-15). The Calaroga Pump Station may be exposed to the following hazards: earthquake, landslide, wildfire, windstorm and winter storm. While flooding was not specified for the Calaroga Pump Station, NHMP Action Item Flood #3 is a high priority action item to address vulnerabilities of sewer pump stations to potential flood events. This action item includes exploring methods of flood-proofing key components and elevating components that can be elevated. Consistent with Action Item Flood#3, locating the mechanical and electrical components of the pump station above the floodplain will decrease the chance of pump station failure during flood events. The City can continue servicing the neighborhood in the event of a flood and there will be a decreased risk of sewage overflows. See findings below regarding the specific analysis of the geotechnical conditions of the site and proposed improvements including the gabion wall, and attached *Geotechnical Design Summary*, memo dated August 17, 2023, and accompanying *Geotechnical Data Report*, from Northwest Geotech, Inc., for detailed analysis of the site characteristics, engineering geological descriptions and investigations completed, and review and assessment of the City’s NHMP.

4. Conclusions and recommendations focused on geologic constraints for the proposed land use or development activity, limitations and potential risks of development, recommendations for mitigation approaches and additional work needed at future development stages including further testing and monitoring.

**Finding:** Geotechnical engineers Northwest Geotech, Inc. (NGI), provided a review (*Geotechnical Design Summary*, memo dated August 17, 2023, and accompanying *Geotechnical Data Report*) of the proposed gabion wall as a method to stabilize the bank and provide structural integrity for the new wet well and associated vault. The report found that the project area is mapped as Columbia River Basalt Group (CRBG) bedrock near the surface and adjacent stretches of the riverbank area show the Missoula Flood Deposits formation manteling the weathered basalt in the form of a bench. Site borings confirmed that the flood deposits are unsaturated and not prone to seismic liquefaction hazards. NGI recommended the use of a welded wire gabion retaining wall to laterally support the new pump station based on the following seismic and static slope stability considerations:

- 1). A gabion wall is generally self-draining, mitigating the primary hazard associated with a retaining wall in the flood zone. The primary hazard is hydrostatic pressure on the back side of a retaining wall during relatively rapid drawdown of flood water.
- 2). A gabion wall is one of the most resistant to overall slope stability hazards, as it forms a relatively large structural mass and wide base that forces any shear planes around it, thus providing a high factor of safety.
- 3). A gabion wall is flexible and can accommodate variable settlement conditions while maintaining all structural integrity.

NGI completed a Geotechnical Data Report (included in the project land use submittal) and found that the weathered basalt was highly fractured and is not anticipated to pose any significant difficulty during construction, while providing a stable wall support. The existing pump station is also embedded in the weathered basalt. The weathered basalt is exposed in the adjacent creek bed, and no on-going erosion is evident (creek is not anticipated to erode vertically in the future). As a result, and based on seismic slope stability studies and long-term groundwater level monitoring, NGI found that the proposed facility and gabion wall treatment are consistent with the intent and goals of the West Linn Natural Hazards Mitigation Plan.

**F. Identification information, including the name and address of the owner, developer, project designer, and the project engineer. (Ord. 1463, 2000; Ord. 1613 § 15, 2013; Ord. 1622 § 28, 2014; Ord. 1662 § 10, 2017)**

**Finding:** This information is provided in the application materials.

## 2.5 Chapter 60: Conditional Uses

### 60.010 PURPOSE

The purpose of this chapter is to provide standards and procedures under which conditional uses may be permitted, enlarged, or altered if the site is appropriate and if other conditions can be met. (Ord. 1589 § 1 (Exh. A), 2010)

### 60.030 ADMINISTRATION AND APPROVAL PROCESS

- A. Conditional use applications shall be decided by the Planning Commission in the manner set forth in CDC 99.060(B). A petition for review by the Council may be filed as provided by CDC 99.240(B).

**Finding:** An application is being submitted for review consistent with CDC 99.060 (B).

- B. All approved conditional use applications in new buildings, or buildings with a major modification, shall be subject to design review under the provisions of Chapter 55 CDC, and in the manner set forth in CDC 99.060(B).

1. Except where stated otherwise in the base zone requirements of other applicable development standards.

**Finding:** Class 1 Design Review is required.

- C. All approved conditional use applications within existing buildings shall not be subject to design review. (Ord. 1635 § 28, 2014; Ord. 1736 § 1 (Exh. A), 2022)

**Finding:** Not applicable—proposal is not within an existing building.



## 60.040 TIME LIMITATION CONDITIONAL USE

Approval of a conditional use that required a design review shall be subject to the time limitations set forth in CDC [55.040](#). Approval of a conditional use that did not require design review shall be void unless either the use is commenced or an extension is granted per CDC [99.325](#) within three years of the approval. (Ord. [1408](#), 1998; Ord. [1589](#) § 1 (Exh. A), 2010; Ord. [1604](#) § 61, 2011)

**Finding:** Not yet applicable.

## 60.050 BUILDING PERMITS FOR APPROVED CONDITIONAL USE

Building permits for all or any portion of a conditional use shall be issued only on the basis of the conditional use plan and conditions as approved by the Planning Commission. (Ord. [1622](#) § 21, 2014)

**Finding:** Not yet applicable.

## 60.060 APPLICATION

- A. A conditional use application shall be initiated by the property owner or the owner's authorized agent.

**Finding:** The conditional use application has been initiated by the property owner (City of West Linn).

- B. A prerequisite to the filing of an application is a pre-application conference at which time the Director shall explain the requirements and provide the appropriate forms as specified in CDC [99.030](#)(B) and (C).

**Finding:** A pre-application conference was held on March 2, 2023.

- C. A prerequisite to the filing of an application is a meeting with the respective City-recognized neighborhood association, per CDC [99.038](#), at which time the applicant will present their proposal and receive comments.

**Finding:** A meeting with Robinwood Neighborhood Association was held on July 11, 2023 to present the proposal and receive comments.

- D. An application for a conditional use shall include the completed application form and:
1. A narrative which addresses the approval criteria set forth in CDC [60.070](#) and which sustains the applicant's burden of proof;
  2. A site plan as provided by CDC [60.080](#); and

3. If site modification or construction is proposed, a storm detention and treatment plan and narrative pursuant to CDC 92.010(E).

One original application form must be submitted. One copy at the original scale and one copy reduced to 11 inches by 17 inches or smaller of all drawings and plans must be submitted. One copy of all other items must be submitted. The applicant shall also submit one copy of the complete application in a digital format acceptable to the City. When the application submittal is determined to be complete, additional copies may be required as determined by the Community Development Department.

**Finding:** An original application form and one copy are being submitted , along with required elements, drawings and plans.

- E. The applicant shall pay the requisite fee. (Ord. 1401, 1997; Ord. 1442, 1999; Ord. 1621 § 25, 2014; Ord. 1622 § 16, 2014; Ord. 1662 § 13, 2017)

**Finding:** The applicant is the City of West Linn; the requisite fees will be waived.

## 60.070 APPROVAL STANDARDS

- A. The Planning Commission shall approve, approve with conditions, or deny an application for a conditional use, except for a manufactured home subdivision in which case the approval standards and conditions shall be those specified in CDC 36.030, or to enlarge or alter a conditional use based on findings of fact with respect to each of the following criteria:

1. The site size and dimensions provide:

- a. Adequate area for the needs of the proposed use; and

**Finding:** Despite constraints posed by the site’s small size and challenging terrain (slopes in some places up to 45%), there is adequate area for the proposed use. In fact, the use must be at this exact location that is already served by a network of sewers.

- b. Adequate area for aesthetic design treatment to mitigate any possible adverse effect from the use on surrounding properties and uses.

**Finding:** The site also provides adequate area to screen the building from adjoining uses and avoid off-site impacts, through proposed landscape plantings on the subject site and one neighboring parcel.

2. The characteristics of the site are suitable for the proposed use considering size, shape, location, topography, and natural features.

**Finding:** The small site size and topography pose challenges that are overcome by the proposed pump station design.

3. The granting of the proposal will produce a facility that provides an overall benefit to the City.

**Finding:** the proposal replaces an essential facility—an existing sewage pump station—moving it out of the floodplain, and producing important environmental and public health benefits.

4. Adequate public facilities will be available to provide service to the property at the time of occupancy.

**Finding:** Public facilities and services are already available to the site.

5. The applicable requirements of the zone are met, except as modified by this chapter.

**Finding:** Chapters 2.1 through 2.6 of the Application show how the applicable requirements of the zone are met.

6. The supplementary requirements set forth in Chapters 52 to 55 CDC and CDC 92.010(E) are met, if applicable.

#### Chapter 52—Signs

**Finding:** This chapter prevents the proliferation of signs and minimizes adverse effects. No signs are proposed for this use.

#### Chapter 53—Sidewalks

**Finding:** Not applicable—no sidewalk uses are proposed.

#### Chapter 54—Landscaping

**Finding:** A landscape plan is proposed to preserve and enhance existing trees and landscape. The required information is provided on Sheet L01 and L02.

#### Chapter 55—Design Review

**Finding:** Class 1 Design Review is required. Compliance narrative appears in Section 2.4 of the Application.

The use will comply with the applicable policies of the Comprehensive Plan.

**Finding:** Chapter 2.8 of the Application documents how compliance with the Comprehensive Plan is achieved.

- B. An approved conditional use or enlargement or alteration of an existing conditional use shall be subject to the development review provisions set forth in Chapter 55 CDC.

**Finding:** Class 1 Design Review is required under CDC Chapter 55.

- C. The Planning Commission may impose conditions on its approval of a conditional use which it finds are necessary to assure the use is compatible with other uses in the vicinity. These conditions may include, but are not limited to, the following (see below).

**Finding:** The nature and location of the existing and proposed facility—a sewage pump station—and its operation leave little flexibility to accommodate conditions of approval as explained below.

1. Limiting the hours, days, place, and manner of operation.

*The pump station operates year-round, round the clock. It is designed with redundant pumping capacity to ensure continuous operation even during maintenance. The location—the site of the existing pump station—is the focal point of the wastewater collection system for this neighborhood. There is no alternative location that could serve this function. Changes in hours, days, manner of operation are not feasible.*

2. Requiring design features which minimize environmental impacts such as noise, vibration, air pollution, glare, odor, and dust.

*The facility design is intended to mitigate off-site impacts:*

*Noise:* The pumps are small, operating underground in a covered wetwell. There will be no off-site noise.

*Vibration:* The pumps are small and designed to avoid vibration. They are the only moving part of the proposed facility, so no vibration will be discernable off-site.

*Air pollution:* The pumps are electric. No air pollution is anticipated.

*Glare:* The proposed pump station has no external glass or reflective surfaces. The single outdoor light on-site is designed in accordance with City standards to prevent glare.

*Odor:* The pump station's covered wetwell and sewers are deep underground. A vent has been designed to install odor controls if needed.

*Dust:* The two accessways will be paved. The proposed pump station operations will generate no dust after construction is completed.

3. Requiring additional setback areas, lot area, or lot depth, or width.

*The site's small size and the need to keep the existing pump station operating while the new facility is constructed constrains the flexibility to provide setbacks. In the front-yard, the facility extends well into the Calaroga Drive right-of-way. The front setback is achieved due to*

*the facility construction substantially below grade. Adequate setbacks are possible on other sides.*

4. Limiting the building height, size or lot coverage, or location on the site.

*Again, there's no flexibility to modify the building height, size, site configuration, or lot coverage.*

5. Designating the size, number, location and design of vehicle access points.

*The current access, configuration and locations will be retained, and a new accessway constructed. There is no flexibility to alter the number, size, location or design of proposed access points.*

6. Requiring street right-of-way to be dedicated and the street to be improved including all steps necessary to address future street improvements identified in the adopted Transportation System Plan.

*The existing street and right-of-way along Calaroga Drive, already dedicated, will be retained and replaced in-kind following construction, in accordance with City standards.*

7. Requiring participation in making the intersection improvement or improvements identified in the Transportation System Plan when a traffic analysis (compiled as an element of a conditional use application for the property) indicates the application should contribute toward.

*The proposed facility will not generate any additional traffic and there are no intersections in the area needing improvements.*

8. Requiring landscaping, screening, drainage, and surfacing of parking and loading areas.

*Designs for landscaping, screening, drainage, surfacing of parking and loading areas are shown in the application.*

9. Limiting the number, size, location, height, and lighting of signs.

*No signage is proposed.*

10. Limiting or setting standards for the location and intensity of outdoor lighting.

*The single outdoor light on-site is designed in accordance with City standards to prevent glare.*

11. Requiring berming, screening, or landscaping and the establishment of standards for their installation and maintenance.

*Plans for berming, screening, and landscaping are included in the application.*

12. Requiring and designating the size, height, location, and materials for fences.

*The height, size, location, and materials for fences as shown in the application are the result of negotiations with City staff.*

13. Requiring the protection and preservation of existing trees, soils, vegetation, watercourses, habitat areas, and drainage areas.

*The existing stream, soils, vegetation, habitat and drainage areas will be protected and preserved as shown in the application. Trees have been surveyed and most will be retained. A permit has already been obtained for necessary tree removal and replacement. (See Appendix I.)*

- D. Aggregate extraction uses shall also be subject to the provisions of ORS [541.605](#).

**Finding:** Not applicable—no aggregate extraction uses are proposed.

- E. The Historic Review Board shall review an application for a conditional use, or to enlarge a conditional use on a property designated as a historic resource, based on findings of fact that the use will:

1. Preserve or improve a historic resource which would probably not be preserved or improved otherwise; and
2. Utilize existing structures rather than new structures. (Ord. [1291](#), 1987; Ord. [1408](#), 1998; Ord. [1544](#), 2007; Ord. [1614](#) § 13, 2013; Ord. [1655](#) § 7, 2016; Ord. [1662](#) § 14, 2017)

**Finding:** Not applicable—the property does not include any designated historic resources.

## 60.080 SITE PLAN AND MAP

- A. All site plans and maps shall include the name, address, and telephone number of the applicant, the scale of the site plan, north arrow, and a vicinity map.

**Finding:** All site plans and maps include the required information.

- B. The applicant shall submit a site plan drawn to an appropriate scale (in order of preference, one inch equals 10 feet to one inch equals 30 feet) which contains the following information:

**Finding:** Site plans are shown at one inch equals 10 feet.

1. The subdivision name, block, and lot number or the section, township, range, and tax lot number.

**Finding:** The required information is provided on sheet G05.

*Parcel Taxlot Number: 21E13CA1101*

*Map Number: 21E13CA*

2. The lot or parcel boundaries, dimensions, and gross area.

**Finding:** The required information is provided on sheet G05. The gross site area is 0.16 acres.

3. The applicant's property and the surrounding property to a distance sufficient to determine the relationship between the applicant's property and proposed development to the adjacent property and development.

**Finding:** This information is shown in Sheet G05.

4. The location, dimensions, and names of all existing and platted streets and other public ways and easements on adjacent property and on the site.

**Finding:** This information is shown on Sheet G05.

5. The location, dimensions, and setback distances of all:
  - a. Existing structures, improvements, utilities, and drainage facilities on adjoining properties;
  - b. Existing structures, improvements, utilities, and drainage facilities to remain on the site; and
  - c. Proposed structures or changes to existing structures, improvements, utilities, and drainage facilities.

**Finding:** The information is shown on Sheet G05.

6. The existing and proposed dimensions of:

- a. The entrances and exits to the site;

**Finding:** The existing and proposed accessways to the site are shown G05.

- b. The parking and circulation areas;

**Finding:** The existing and proposed parking areas are shown on Sheet G05.

c. Loading and service areas for waste disposal, loading and delivery;

**Finding:** There are no proposed loading and service areas for waste disposal. No waste will be generated onsite.

d. Pedestrian and bicycle circulation area;

**Finding:** There is no existing or proposed pedestrian or bicycle circulation.

e. On-site outdoor recreation spaces and common areas; and

**Finding:** There are no outdoor recreation areas.

f. Above-ground utilities.

**Finding:** Existing and proposed utilities are shown on Sheet C03.

7. The location of areas to be landscaped and the proposed landscape plan.

**Finding:** Existing landscaping is shown on Sheet L01.

8. The location of all trees having a six-inch caliper at a height of five feet.

**Finding:** The location of existing trees are shown on Sheet D01. Locations of proposed trees are shown on Sheet L01.

C. The applicant shall submit the site plan on a map showing two-foot contours up to 20 percent grade and 10-foot contours on grades above 20 percent. (Ord. [1636](#) § 43, 2014)

**Finding:** A contour plan is shown on Sheet G05.

## 60.090 ADDITIONAL CRITERIA FOR TRANSPORTATION FACILITIES (TYPE III)

A. Construction, reconstruction, or widening of highways, roads, bridges or other transportation facilities that are (1) not designated in the adopted West Linn Transportation System Plan (“TSP”) or (2) not designed and constructed as part of an approved, active, development order are allowed in all zoning districts subject to the conditional use and all other applicable provisions of the CDC and satisfaction of all of the following criteria:

1. The project and its design are consistent with West Linn’s adopted TSP, with the State Transportation Planning Rule (OAR 660-012), and with the adopted Regional Transportation Plan (RTP).



2. The project design is compatible with abutting land uses in regard to noise generation and public safety and is consistent with the applicable zoning and development standards and criteria for the abutting properties.
3. The project design minimizes environmental impacts to identified wetlands, wildlife habitat, air and water quality, cultural resources, and scenic qualities, and a site with fewer environmental impacts is not reasonably available.
4. The project preserves or improves the safety and function of the facility through access management, traffic calming, or other design features.
5. The project includes provisions for bicycle and pedestrian access and circulation consistent with the comprehensive plan, the requirements of this chapter, and the TSP.

**Finding:** Not applicable—the proposal does not include construction or widening of roads, highways, bridges or other transportation facilities. These provisions are not applicable.

- B. State transportation system facility or improvement projects. The State Department of Transportation (“ODOT”) shall provide a narrative statement with the application demonstrating compliance with all of the criteria and standards in subsections (A)(1) through (5) of this section. Where applicable, an environmental impact statement or environmental assessment may be used to address one or more of these criteria.

**Finding:** Not applicable—the proposal does not include state transportation system facilities or improvements.

- C. Proposal inconsistent with TSP/TPR. If the City determines that the proposed use or activity or its design is inconsistent with the TSP or TPR, then the applicant shall apply for and obtain a plan and/or zoning amendment prior to or in conjunction with conditional use permit approval. (Ord. 1584, 2008; Ord. 1650 § 1 (Exh. A), 2016)

**Finding:** Not applicable—no transportation facilities are proposed.

## 60.100 ADDITIONAL CRITERIA FOR SCHOOLS AND OTHER GOVERNMENT FACILITIES

Schools and other government facilities that attract a regular and significant volume of users shall, to the greatest extent possible, be centrally located relative to the majority of the population that they will serve and be serviceable by sidewalks and bike routes/lanes. Police and fire stations shall meet these standards to the greatest extent possible but it is acknowledged that access to arterials remains a key locational determinant for those uses. (Ord. 1590 § 1, 2009)

**Finding:** Not applicable—no schools or other government facilities are proposed that attract a significant volume of users.

## 2.6 Chapter 96: Street Improvement Construction

### 96.010 CONSTRUCTION REQUIRED

A. Street improvements for residential construction are required when:

1. Construction of a new single-family attached or detached structure (replacement of an existing structure is exempt); or
2. Replacement of a single-family home increases the square feet by 50 percent or greater; or
3. Construction of a new multifamily structure; or
4. Increase in dwelling unit density on site (accessory dwelling units are exempt).

**Finding:** None of these criteria are applicable to the proposed pump station replacement—no dwellings are proposed.

B. Street improvements for commercial construction are required when:

1. Construction of a new commercial structure; or
2. Remodel of an existing commercial structure with an increase in floor area that requires additional parking; or
3. Change in use that requires additional parking; or
4. Construction that increases the dwelling unit density on site; or
5. Construction which requires a change in type, number, or location of accessways; or
6. Replacement of an existing structure that requires additional parking. (Ord. [1314](#), 1992; Ord. [1442](#), 1999; Ord. [1544](#), 2007; Ord. [1547](#), 2007; Ord. [1590](#) § 1, 2009; Ord. [1613](#) § 21, 2013; Ord. [1739](#) § 2 (Exh. B), 2022

**Finding:** Criteria #1, 2, 3, 4, and 6 are not applicable to the proposed pump station replacement:

- No new commercial structure
- No additional parking
- No dwelling units

Criterion #5 is applicable, with the addition of one accessway in conjunction with the replacement pump station (see Sheet G05).

## 96.020 FEE-IN-LIEU

- A. An applicant may apply for a waiver of street improvements and the option to pay a fee-in-lieu (in accordance with the City's adopted fee structure) of constructing street improvements if one of the following are met:
1. Located on a cul-de-sac with no existing curb and/or no existing sidewalk; or
  2. Located on a street less than 1,320 linear feet in length and not planned as a through street; or
  3. Located more than 1,320 linear feet from nearest street improvements on the same street or connecting street. (Ord. [1739](#) § 2 (Exh. B), 2022)

**Finding:** Street improvements on Calaroga Drive will be provided as part of the project as shown in Sheet C01. The roadway will be replaced in kind in accordance with City standards. Any in-lieu fee will be determined through the review process.

## 96.030 STANDARDS

Street improvements shall be installed according to the City standards and shall be completed prior to the issuance of any occupancy permit for the new or remodeled structure or building. In unimproved areas of the City, the City Engineer may grant a time extension of the provisions of this section; provided the applicant submit sufficient security in an amount and quantity satisfactory to the City Attorney to assure payment of such improvement costs. (Ord. [1739](#) § 2 (Exh. B), 2022. Formerly 96.020.)

**Finding:** Not yet applicable.

## 2.7 Chapter 99: Procedures for Decision Making: Quasi-Judicial

### 99.010 PURPOSE

The purpose of this chapter is to establish procedures applicable to the Community Development Code for the consideration of development applications, for the consideration of quasi-judicial Comprehensive Plan amendments, and for the consideration of appeals or petitions for review of decisions. (Ord. [1474](#), 2001; Ord. [1568](#), 2008)

### 99.030 APPLICATION PROCESS: WHO MAY APPLY, PRE-APPLICATION CONFERENCE, REQUIREMENTS, REFUSAL OF APPLICATION, FEES

A. Who may apply.

1. Applications for approval required under this chapter may be initiated by:

- a. The owner of the property that is the subject of the application or the owner’s duly authorized representative;
- b. The purchaser of such property who submits a duly executed written contract or copy thereof, which has been recorded with the Clackamas Clerk;
- c. A lessee in possession of such property who submits written consent of the owner to make such application; or
- d. Motion by the Planning Commission or City Council.

2. Any person authorized by this chapter to submit an application for approval may be represented by an agent who is authorized in writing by such a person to make the application.

**B. Pre-application conferences.**

1. Subject to subsection (B)(4) of this section, a pre-application conference is required for, but not limited to, each of the following applications:

- a. Boundary changes, per Chapter 81 CDC;
- b. Amendments to the Comprehensive Plan;
- c. Amendments to the Zoning Map;
- d. Conditional uses;
- e. Design review (Class I and Class II);

[...]

**Finding:** The proposal is considered to be a Conditional Use subject to Class I Design Review, and a preapplication conference (project file #PA-23-04) was held on March 2, 2023, with the West Linn Planning Department, in compliance with CDC 99.030(B). The City of West Linn is the property owner of record, and authorized the pre-application conference application.

[...]

- 5. At such conference, the Planning Director or designee shall:
  - a. Cite the Comprehensive Plan map designation;
  - b. Cite the applicable substantive and procedural ordinance provisions;

- c. Provide technical data and assistance which will aid the applicant;
- d. Identify other policies and regulations that relate to the application;
- e. Identify other pertinent factors that relate to the application; and
- f. Provide the applicant with a written description of all rights for appeal and provide access to all administrative procedures.

6. The failure of the Director to provide any of the information required by this section shall not constitute a waiver of the standards, criteria, or requirements of the application.

7. At least 10 days prior to the scheduled date of the conference, the City shall make the pre-application conference schedule available to the public. Within 10 days following the conference, the City shall make staff-prepared written notes summarizing the contents of the meeting available to the public. Failure to comply with this section due to technical or administrative problems is not a procedural defect entitling any party to a delay in the hearing process.

8. The Planning Director shall prepare administrative procedures designed to allow citizens to attend and participate in pre-application conferences for applications. Lack of neighborhood association participation in a pre-application conference is not a procedural defect entitling any party to a delay in the hearing process.

9. If the applicant is not the owner of the subject property, the applicant shall provide written evidence that the owner has consented to the pre-application conference prior to it being scheduled.

**Finding:** The applicant complied with these requirements in the pre-application conference.

**C. The requirements for making an application.**

1. The application shall be made on forms provided by the Director as provided by CDC 99.040(A)(1);

2. The application shall be complete and shall contain the information requested on the form, shall address the appropriate submittal requirements and approval criteria in sufficient detail for review and action, and shall be accompanied by the deposit or fee required by CDC 99.033. No application will be accepted if not accompanied by the required fee or deposit. In the event an additional deposit is required by CDC 99.033 and not provided within the time required, the application shall be rejected without further processing or deliberation and all application materials shall be returned to the applicant, notwithstanding any determination of completeness. (Ord. 1527, 2005; Ord. 1568, 2008; Ord. 1590 § 1, 2009; Ord. 1599 § 6, 2011; Ord. 1614 § 14, 2013; Ord. 1622 § 30, 3014; Ord. 1635 § 36, 2014; Ord. 1636 § 60, 2014; Ord. 1638 § 3, 2015; Ord. 1675 § 55, 2018)

**Finding:** The applicant has complied with the requirements for making an application.

## 99.033 FEES

The Council shall adopt a schedule of fees reasonably calculated to defray the expenses of the administrative process. The Council may establish either a set fee or a deposit system in which the applicant pays a deposit and the City determines the total administrative cost at the end of the process and refunds any unused amount of the deposit to the applicant. No additional deposit shall be required for additional costs that are incurred because the matter is referred to or called up by a higher decision-making authority. The Council shall charge no fees for City-initiated land use applications or appeals filed by a recognized neighborhood association pursuant to the provisions of CDC 99.240. (Ord. 1527, 2005; Ord. 1568, 2008; Ord. 1604 § 70, 2011)

**Finding:** The applicant understands the basis for which fees are calculated, and the provision that there shall be no fees charged for a City-initiated land use application.

## 99.035 ADDITIONAL INFORMATION REQUIRED, WAIVER OF REQUIREMENTS AND REPORT REQUIRED

A. The Planning Director may require information in addition to that required by a specific chapter in the Community Development Code; provided, that:

1. The chapter expressly authorizes that additional information may be required;
2. The information is needed to properly evaluate the proposed site plan or proposal; and
3. The need can be justified on the basis of a special or unforeseen circumstance.

B. The Planning Director may waive a specific requirement for information or a requirement to address a certain approval standard subject to the provisions of subsection C of this section provided:

1. The Planning Director finds that specific information is not necessary to properly evaluate the application; or
2. The Planning Director finds that a specific approval standard is not applicable to the application.

C. Where a requirement is waived, the Planning Director shall cite in the staff report on the application the specific requirements waived and the reasons for the waiver. The decision of the Planning Director to waive the requirement is subject to review and denial by the approval authority or the appeal authority. (Ord. 1568, 2008)

**Finding:** The applicant understands the provisions for additional information, or for a waiver of requirements.

## 99.038 NEIGHBORHOOD CONTACT REQUIRED FOR CERTAIN APPLICATIONS

Prior to submittal of an application for any subdivision, conditional use permit, multi-family project, planned unit development of four or more lots, non-residential buildings over 1,500 square feet, or a zone change that requires a Comprehensive Plan amendment, the applicant shall contact and discuss the proposed development with any affected neighborhood as provided in this section. Although not required for other or smaller projects, contact with neighbors is highly recommended. The Planning Director may require neighborhood contact pursuant to this section prior to the filing of an application for any other development permit if the Director deems neighborhood contact to be beneficial.

A. Purpose. The purpose of neighborhood contact is to identify potential issues or conflicts regarding a proposed application so that they may be addressed prior to filing. This contact is intended to result in a better application and to expedite and lessen the expense of the review process by avoiding needless delays, appeals, remands, or denials. The City expects an applicant to take the reasonable concerns and recommendations of the neighborhood into consideration when preparing an application. The City expects the neighborhood association to work with the applicant to provide such input.

B. The applicant shall contact by letter all recognized neighborhood associations whose boundaries contain all or part of the site of the proposed development and all property owners within 500 feet of the site.

C. The letter shall be sent to the president of the neighborhood association, and to one designee as submitted to the City by the neighborhood association, and shall be sent by regular mail to the other officers of the association and the property owners within 500 feet. If another neighborhood association boundary is located within the 500-foot notice radius, the letter shall be sent to that association's president, and to one designee as submitted to the City by the neighborhood association as well. The letter shall briefly describe the nature and location of the proposed development, and invite the association and interested persons to a meeting to discuss the proposal in more detail. The meeting shall be scheduled at the association's regularly scheduled monthly meeting, or at another time at the discretion of the association, and not less than 20 days from the date of mailing of the notice. If the meeting is scheduled as part of the association's regular monthly meeting, the letter shall explain that the proposal may not be the only topic of discussion on the meeting agenda. The letter shall encourage concerned citizens to contact their association president, or their association designee, with any questions that they may want to relay to the applicant.

Neighborhood contact shall be initiated by the applicant by mailing the association president, and to one designee as submitted to the City by the neighborhood association, a letter, return receipt requested, formally requesting, within 60 days, a date and location to have their required neighborhood meeting. The 60 days shall be calculated from the date that the applicant mails this letter to the association. If the neighborhood association does not want to meet within the 60-day timeframe, or if there is no neighborhood association, the applicant may hold a public meeting during the evening after 6:00 p.m., or on the weekend no less than 20 days from the date of mailing of the notice. All meetings shall be held at a location open to the public within the boundaries of the association or at a public facility within the City of West Linn. If the meeting is held at a business, it shall be posted at the time of the meeting as the meeting place and shall note that the meeting is open to the public and all interested persons may attend.

D. On the same date the letters described in subsections A through C of this section are mailed, the applicant shall provide and post notice on the property subject to the proposed application. The notice shall be posted at a location visible from the public right-of-way. If the site is not located adjacent to a through street, then an additional sign shall be posted on the nearest through street. The sign notice shall be at least 11 inches by 17 inches in size on durable material and in clear, legible writing. The notice shall state that the site may be subject to a proposed development (e.g., subdivision, variance, conditional use) and shall set forth the name of the applicant and a telephone number where the applicant can be reached for additional information. The site shall remain posted until the conclusion of the meeting.

E. An application shall not be accepted as complete unless and until the applicant demonstrates compliance with this section by including with the application:

1. A copy of the certified letter to the neighborhood association with a copy of return receipt;
2. A copy of the letter to officers of the association and to property owners within 500 feet, including an affidavit of mailing and a copy of the mailing list containing the names and addresses of such owners and residents;
3. A copy of the required posted notice, along with an affidavit of posting;
4. A copy of the minutes of the meetings, produced by the neighborhood association, which shall include a record of any verbal comments received, and copies of any written comments from property owners, residents, and neighborhood association members. If there are no minutes, the applicant may provide a summary of the meeting comments. The applicant shall also send a copy of the summary to the chair of the neighborhood association. The chair shall be allowed to supplement the summary with any additional comments regarding the content of the meeting, as long as such comments are filed before the record is closed;
5. An audiotape of the meeting; and
6. In the event that it is discovered by staff that the aforementioned procedures of this section were not followed, or that a review of the audio tape and meeting minutes show the applicant has made a material misrepresentation of the project at the neighborhood meeting, the application shall be deemed incomplete until the applicant demonstrates compliance with this section. (Ord. 1425, 1998; Ord. 1474, 2001; Ord. 1568, 2008; Ord. 1590 § 1, 2009; Ord. 1613 § 23, 2013; Ord. 1635 § 37, 2014)

**Finding:** The Conditional Use land use process requires an applicant to prepare and present the proposed project to the applicable neighborhood association, prior to submittal of a land use application. The project team presented to the Robinwood Neighborhood Association on July 11, 2023, at 7:00 p.m. In accordance with the requirements of the Community Development Code Section 99.038, the Neighborhood Association leadership was mailed on June 8, 2023, with a request to present the project details to the Neighborhood Association. Property owners within 500 feet of the site were mailed notice of the meeting on June 22, 2023, with posted notice of the meeting on provided on the subject site.

Affidavits of mailing and posting, the meeting attendee list, presentation, and audio file from the meeting has been included with this application, in accordance with the requirements of the CDC Section 99.038.



## 99.040 DUTIES OF DIRECTOR

### A. The Director shall:

1. Prepare application forms made pursuant to the standards contained in the applicable State law, Comprehensive Plan and implementing ordinance provisions;
2. Accept all development applications that comply with the provisions of CDC [99.030](#);
3. After accepting an application pursuant to this chapter:
  - a. Determine whether an application is complete, and comply with State statutes governing the completeness determination for applications. The determination of the Director is subject to review by the approval authority in its deliberation on the application;
  - b. Give notice as provided by CDC [99.080](#) and [99.090](#);
  - c. Prepare a staff report which shall include findings as to whether or not the application meets the approval criteria of the applicable Community Development Code sections as presented in the application, and whether or not the criteria can be met with conditions;
  - d. Make the application, all documents or evidence relied upon by the applicant and applicable criteria available at least 20 days prior to the hearing or date of the Director's decision. Make the staff report available at least 10 days prior to the scheduled date of the public hearing(s);
  - e. Act on the development application pursuant to CDC [99.060\(A\)](#) and [99.160](#) or cause a hearing to be held pursuant to CDC [99.060\(B\)](#) through (D) and CDC [99.170](#) through [99.230](#), unless the applicant has requested or consented to a delay;
4. Administer the hearings process pursuant to CDC [99.170](#) through [99.230](#);
5. Maintain a register of all applications that have been filed for a decision. The register shall at all times identify at what stage the application is in the process. The register shall be posted on the City website unless technical problems prevent this;
6. File notice of the final decision in the records of the Community Development Department and mail a copy of the notice of the final decision to the applicant and all parties with standing.

The notice of the final decision shall contain the information set forth under CDC [99.130\(B\)](#);

7. Maintain and preserve the file for each application. The file shall include, as applicable, a list of persons required to be given notice and a copy of the notice given pursuant to CDC [99.080](#) and the accompanying affidavits; the application and all supporting information; the staff report; the final decision including the findings, conclusions, and conditions, if any; all correspondence; the minutes

of any meetings at which the application was considered; and any other exhibit(s), information, or documentation which was considered by the hearing body with respect to the application; and

8. Administer the appeals and review process pursuant to CDC [99.240](#) through [99.320](#). (Ord. [1474](#), 2001; Ord. [1568](#), 2008; Ord. [1621](#) § 25, 2014)

**Finding:** The applicant understands the duties of the Director.

## 99.060 APPROVAL AUTHORITY

This section explains the authority of the Planning Director, Planning Commission, City Council, and Historic Review Board as it relates to quasi-judicial and legislative action.

A. Planning Director authority. The Planning Director shall have the authority to:

1. Approve, deny, or approve with conditions the following applications:
  - a. A temporary use or structure application for a period no more than 120 days, including all extensions (Chapter [35](#) CDC), and not associated with another land use approval.
  - b. A home occupation application (Chapter [37](#) CDC).
  - c. Access restrictions (Chapter [48](#) CDC).
  - d. A minor partition (Chapter [85](#) CDC).
  - e. A final subdivision plat (Chapter [89](#) CDC).
  - f. A final partition plat (Chapter [89](#) CDC).
  - g. A lot line adjustment (Chapter [85](#) CDC).
  - h. Enlargement or alteration of a non-conforming single-family structure containing a conforming use (Chapter [66](#) CDC).
  - i. Decide applications for a determination of unlisted parking requirements (Chapter [46](#) CDC).
  - j. *Repealed by Ord. 1735.*
  - k. Parks Design Review, Class I (Chapter [56](#) CDC).
  - l. Design Review, Class I (Chapter [55](#) CDC).
  - m. A sign application (Chapter [52](#) CDC).

- n. Sidewalk use permit (Chapter [53](#) CDC).
  - o. Flood management area permit (Chapter [27](#) CDC).
  - p. *Repealed by Ord. [1622](#).*
  - q. Tualatin River protection permit (Chapter [28](#) CDC).
  - r. Water resource area permit (Chapter [32](#) CDC).
  - s. Class I variance (Chapter [75](#) CDC).
  - t. Willamette River Greenway permit (Chapter [28](#) CDC).
  - u. Extensions of approval when the Planning Director acted as the initial decision-making authority.
  - v. Class I Historic Design Review (Chapter [25](#) CDC).
  - w. A demolition permit for a non-contributing or not in period primary structure or an accessory structure (Chapter [25](#) CDC).
2. Approve a use permitted under prescribed conditions provided all of the conditions are satisfied.
  3. Make initial interpretations of the provisions of the code.
  4. Make the initial determination regarding the status of the following:
    - a. Non-conforming structure (Chapter [66](#) CDC).
    - b. Non-conforming structure involving a non-conforming use (Chapter [65](#) CDC).
    - c. Non-conforming use of land (Chapter [67](#) CDC).
- B. Planning Commission authority. The Planning Commission shall have the authority to:
1. Make a recommendation to approve, deny, or approve with conditions to the Council:
    - a. A quasi-judicial Comprehensive Plan Map amendment (Chapter [105](#) CDC).
    - b. A quasi-judicial zone change application pursuant to Chapter [105](#) CDC, excluding applications requesting the designation or removal of a designation for a historic resource.
  2. Approve, deny, or approve with conditions the following applications:

- a. A temporary use or structure application (Chapter [35](#) CDC) for a minimum of 121 days to no more than one year, or an application associated with another land use approval.
  - b. A conditional use (Chapter [60](#) CDC).
  - c. Enlargement of a non-conforming use or alteration for a structure containing a non-conforming use (Chapter [66](#) CDC).
  - d. Enlargement or alteration of a non-single-family residential non-conforming use (Chapter [66](#) CDC).
  - e. Class II variance or special waiver (Chapter [75](#) CDC).
  - f. Subdivision (Chapter [85](#) CDC).
  - g. Planned unit development (Chapter [24](#) CDC).
  - h. Design review, Class II (Chapter [55](#) CDC).
  - i. Parks design review, Class II (Chapter [56](#) CDC).
  - j. Any matter not specifically assigned to another approval authority.
  - k. Extensions of approval when the Planning Commission acted as the initial decision-making authority.
- 3. Revoke or modify an approval as provided by CDC [99.330](#) for any application approved by the Planning Commission or Planning Director.
  - 4. Make an unlisted use determination.
  - 5. An appeal of the Planning Director's interpretation of the code pursuant to CDC [01.060](#).
- C. City Council authority. The Council shall have the authority to:
- 1. Approve, deny, or approve with conditions applications for the following development applications:
    - a. A quasi-judicial Comprehensive Plan Map amendment (Chapter [105](#) CDC).
    - b. A quasi-judicial zone change application pursuant to Chapter [105](#) CDC.
    - c. Boundary change proposals (Chapter [81](#) CDC).
  - 2. Consider an appeal or review of a decision made by the Planning Director under the provisions of CDC [99.240\(A\)](#) and [99.080\(B\)](#).

3. Consider an appeal or review of a decision made by the Planning Commission or Historic Review Board, whether on the Council’s own motion, or otherwise as provided by CDC [99.240](#).
4. Decide an appeal of the Director’s interpretation of zoning boundaries as provided by CDC [05.040](#).
5. Revoke or modify an approval as provided by CDC [99.330](#) for any application approved by the City Council, including an application approved by the City Council on appeal from another City decision-making authority.

**Finding:** The applicant understands and acknowledges that once a complete application is received, the proposal will be reviewed for compliance by the Planning Department, with a Public Hearing by the Planning Commission, who will approve, deny, or approve with conditions the Conditional Use application.

## 99.070 CONSOLIDATION OF PROCEEDINGS

A. When an applicant requests more than one approval, and more than one approval authority is required to decide the applications, the proceedings shall be consolidated so that one approval authority shall decide all applications in one proceeding. In such cases, the hearings shall be held by the approval authority having original jurisdiction over one of the applications under CDC [99.060](#), in the following order of preference: City Council, Planning Commission or Historic Review Board, or the Planning Director.

1. However, expedited land division applications shall be processed as described in Chapter [197](#) ORS, regardless of the number of approvals requested.

B. When an applicant requests to undertake preliminary work, for site preparation or analysis, the Director may allow decisions within the Director’s authority to precede the subsequent decision required for review by the decision-making body. (Ord. [1474](#), 2001; Ord. [1568](#), 2008; Ord. [1635](#) § 39, 2014)

**Finding:** The applicant acknowledges the requirements for consolidation of proceedings.

## 99.080 NOTICE

Notice shall be given in the following ways:

A. **Class A Notice.** Notice of proposed action or a development application pursuant to CDC [99.060](#) shall be given by the Director in the following manner:

1. At least 20 days prior to the scheduled hearing date notice shall be sent by mail to:
  - a. The applicant or the applicant’s agent, and the property owner of record on the most recent property tax assessment roll where such property is located.
  - b. All property owners of record on the most recent property tax assessment roll where such property is located within 500 feet of the site.

- c. Any affected governmental agency which has entered into an intergovernmental agreement with the City which includes provision for such notice; plus, where applicable, the Oregon Department of Transportation, Tri-Met, neighboring local jurisdictions, Clackamas County Department of Transportation and Development, and Metro.
  - d. The affected recognized neighborhood association or citizens advisory committee.
  - e. For a hearing on appeal or review, all parties and persons with standing described in CDC [99.140](#) to an appeal or petition for review.
2. At least 10 days prior to the hearing or meeting date, notice shall be given in a newspaper of general circulation in the City. An affidavit of publication shall be made part of the administrative record.
- a. Decisions pursuant to CDC [99.060\(A\)](#), Planning Director authority, are exempt from the requirements of this subsection.
3. At least 10 days prior to the hearing or meeting date, the Planning Director shall cause a sign to be placed on the property which is the subject of the decision or, if the property does not have frontage on a public street, adjacent to the nearest public street frontage in plain view and shall state, "This property is the subject of a land use decision," with the type of use or request indicated.
- If the application is not located adjacent to a through street, then an additional sign shall be posted on the nearest through street.
4. At least 10 days but no more than 40 days prior to hearing of a proposed zone change for manufactured home parks, notice shall be given to the respective manufactured home park residents.
5. The Director shall cause an affidavit of mailing of notice and posting of notice to be filed and made part of the administrative record.
6. At the conclusion of the land use action the signs shall be removed.

B. Class B Notice. Notice of a proposed action on a development application pursuant to CDC [99.060](#) shall be given by the Director in the following manner:

1. At least 14 days prior to the decision date, a notice shall be sent by mail to:
  - a. The applicant or their agent;
  - b. The affected recognized neighborhood association or citizens advisory committee; and
  - c. All property owners of record within 300 feet of the site perimeter;

2. At least 10 days prior to the earliest date that the approval authority can take action on the application, the applicant shall place a sign, provided by the Community Development Department, on the subject property in plain view. The sign shall state, "This property is the subject of a land use decision," with the type of use or request indicated.

3. The Director shall cause an affidavit of mailing of notice and posting of notice to be filed and made part of the administrative record.

4. At the conclusion of the land use action the signs shall be removed.

C. Notice for expedited and division applicants shall comply with the requirements of Chapter [197](#) ORS.

D. Notice for a boundary change application shall comply with the requirements of ORS [197.763](#), Chapter [222](#) ORS, and the Metro Code.

E. Table of notices. The following notice summary identifies the appropriate type of notice for the various land use applications of CDC [99.060](#).

**Finding:** The applicant will work with the Planning Director to ensure proper notice of the land use applications is provided in accordance with CDC 99.080.

Land Use Action	Type of Notice
Amendment or Modification of Application or Permit	Same as original application
Appeal or Review of Decision	A
Boundary Change	Special
Code Interpretation	Notice to parties requesting the interpretation
Comprehensive Plan:	
Map Amendment	A
Plan/Code Text Amendment (Legislative Action)	A***
Conditional Use	A
Design Review:	
Class I	B
Class II	A
Determination of Unlisted Use	No Notice
Enlarge or Alter Non-conforming Use/Structure:	
Commercial or Industrial	A
Single-Family Residential	B
Erosion and Sediment Control Permit	No Notice

Land Use Action	Type of Notice
Expedited Land Division	per State statute requirements
Extensions of Approvals	Same notice as original application
Flood Management Area	B**
Final Plat and Partition Plat	No Notice
Historic Resources:	
Class I Historic Design Review	B
Class II Historic Design Review	B
Designation or Removal of Historic Resource Designation	A
Demolition	A
Relocation	B
Home Occupation	No Notice
Minor Partition	A
Planned Unit Development	A
Property Line Adjustment	No Notice
Revocation of Approval	A
Sidewalk Use Permit	No Notice
Sign Permit	No Notice
Subdivision	A
Temporary Use Permit:	
60 days or less; 60-day extension	No Notice
Over 60 days, up to 1 year	A
Tualatin River Setback:	
Uses permitted outright and not subject to design review	No Notice
Uses permitted outright and subject to design review	B
Uses requiring conditional use permit and design review	A
Street Vacations	(per State statute requirements)
Variances:	
Class I (involves a small change with minor or no effect)	B



Land Use Action	Type of Notice
Class II (involves a significant change from code requirements)	A
Water Resource Area Permit (NDW)	A**
Willamette River Greenway: Development Permit	A**
Uses requiring conditional use permit and design review	A**
Zone Change	A

\*\*Plus COE/DSL is notified \*\*\*Plus DLCD notice

(Ord. [1425](#), 1998; Ord. [1474](#), 2001; Ord. [1545](#), 2007; Ord. [1547](#), 2007; Ord. [1565](#), 2008; Ord. [1568](#), 2008; Ord. [1589](#) § 1 (Exh. A), 2010; Ord. [1613](#) § 25, 2013; Ord. [1614](#) § 16, 2013; Ord. [1621](#) § 25, 2014; Ord. [1635](#) § 40, 2014; Ord. [1636](#) § 61, 2014)

**Finding:** The applicant acknowledges the notice requirements of CDC 99.060.

## 99.090 CONTENTS OF NOTICE

A. Notices mailed pursuant to this code shall comply with applicable provisions of the Oregon Revised Statutes (ORS). Except for expedited land division review, for which Chapter [197](#) ORS shall apply, notice given to persons entitled to mailed or published notice pursuant to CDC [99.060](#) shall:

1. Explain the type of application and what proposed uses could be authorized.
2. List the applicable criteria from the ordinance and plan.
3. Set forth street address (if existing) and other easily understood geographical reference of the subject property.
4. State the date, time, and location of hearing or, for the Planning Director's decisions, the earliest date upon which the Director will make a decision.
5. State that failure to raise an issue in a hearing, in person, or by letter, or failure to provide sufficient specificity to afford the decision-maker an opportunity to respond to the issue, precludes appeal to LUBA on that issue.
6. Include the name of government contact and phone number.
7. State that the application, all documents or evidence relied upon by the applicant and applicable criteria are available for inspection at no cost, and copies at reasonable cost.

8. State that a copy of the staff report will be available for inspection at no cost at least 10 days prior to the hearing, and copies at reasonable cost.

9. A statement that public and written testimony are invited, and including a general explanation of the requirements for submission of testimony and the procedure for conduct of hearings.

B. In addition to the ORS requirements, the notice shall identify the following:

1. The type of land use action proposed (e.g., “four-lot subdivision”).

2. Community Development Department file number. (Ord. [1474](#), 2001; Ord. [1568](#), 2008; Ord. [1621](#) § 25, 2014)

**Finding:** The applicant acknowledges the contents required in the notice.

## 99.100 MECHANICS OF GIVING NOTICE AND FAILURE TO RECEIVE NOTICE

A. The notification list used for giving notice required by this code under CDC [99.080](#) shall be compiled from the most recent property tax assessment roll.

B. The failure of a property owner to receive notice shall not invalidate the action provided a good faith attempt was made to notify all persons entitled to notice.

C. Personal notice is deemed given when the notice is deposited with the United States Postal Service. Published notice is deemed given on the date it is published.

D. In computing the length of time that notice was given, the first date notice is given shall be excluded and the day of the hearing or decision by the Director shall be included. (Ord. 1401, 1997; Ord. 1568, 2008)

**Finding:** The applicant acknowledges the mechanics for providing notice and failure to receive notice, and will work with the City to comply with these requirements.

## 99.110 DECISION-MAKING PROCESS OF APPROVAL AUTHORITY

A. The decision shall be based on proof by the applicant that the application fully complies with:

1. The applicable standards of any provision of this code or other applicable implementing ordinance.

B. Consideration may also be given to:

1. A mistake or inconsistency in the Comprehensive Plan or Zoning Map as it relates to the property which is the subject of the development application; and

2. Factual oral testimony or written statements from the parties, neighborhood plans, other persons and other governmental agencies relevant to the existing conditions or factors in subsection A or (B)(1) of this section.

C. In all cases, the decision shall include a statement in a form which includes findings as to whether or not the application meets the approval criteria of the applicable Community Development Code sections.

D. The approval authority may:

1. Adopt the findings and conclusions contained in the staff report;
2. Adopt the findings and conclusions of a lower approval authority;
3. Adopt its own findings and conclusions;
4. Adopt the findings and conclusions submitted by any party; or
5. Adopt the findings and conclusions from another source, either with or without modifications, having made a tentative decision and having directed the staff to prepare findings for review and to provide an opportunity for all parties to comment upon them.

E. The decision may be for denial, approval, or approval with conditions, pursuant to CDC [99.160](#) and [99.170](#), where such conditions are necessary to satisfy the applicable standards of any provision of this code or other applicable implementing ordinance.

F. The final decision shall be a decision which is in writing and which has been:

1. Formally adopted by the decision-making authority and filed with the Director within 14 working days of the formal adoption of the decision; or
2. Signed by the Director in the case of a decision by the Director and filed as a final decision within 14 working days of the signed decision; or
3. Formally adopted by the Council and signed by the Mayor or the president of the Council in the case of an appeal. (Ord. [1474](#), 2001; Ord. [1568](#), 2008)

**Finding:** The applicant understands the approval authority process and proceedings.

## 99.120 AMENDMENTS

This section explains how amendments to projects subject to the quasi-judicial decision making process are processed.

A. An amendment application shall be required if the Planning Director determines that the proposed revisions will change the project by a factor greater than 10 percent in a quantifiable manner (e.g., number of proposed lots, square footage of proposed buildings, number of parking spaces, relocation of

building footprints). Non-quantifiable changes shall also require an amendment if they result in significant differences between the approved project and the revised project, or if the changes call into question compliance with a relevant approval criterion.

B. Amendments shall be reviewed by the initial decision-making authority. For example, if the Planning Commission heard the application initially, then it would hear the amendment application.

C. Rather than provide full submittal, the Planning Director shall identify the parameters of the submittal appropriate to the amendment and applicable approval criteria. For example, if the applicant only requests to redesign the architecture of a building, but not increase square footage or building mass, then the submittal of a site plan, architectural elevations, material/color board, and narrative specific to the architecture and relevant design review approval criteria would be appropriate. Conversely, no new landscaping, grading plans, etc., would be necessary since no changes are proposed for those items. The submittal should be comprehensive and sufficient to provide the decision-making authority with all necessary information while not being redundant and requiring information which is already part of the record of the original application.

D. If the proposed revisions will change the project by a factor greater than 25 percent in a quantifiable manner, or if the land area upon which the project is proposed changes, then a new application shall be required. (Ord. [1568](#), 2008)

**Finding:** The applicant acknowledges the requirements and limitations for an amendment to approved plans.

## 99.125 STAGED OR PHASED DEVELOPMENT

An applicant may elect to develop a proposed project in phases. The timing of each development phase shall be set forth in the application and subject to approval by the appropriate approval authority. Each phase shall meet all applicable development standards individually (e.g., access, parking, landscaping, utilities, etc.) without having to rely upon subsequent phases. Each phase shall also install all necessary improvements to serve the development within that phase. (Ord. [1474](#), 2001; Ord. [1568](#), 2008)

**Finding:** The applicant is not planning to develop the project in phases.

## 99.130 NOTICE OF FINAL DECISION

A. The final decision by the Planning Director shall be filed in the records of the Community Development Department after the decision is signed by the Planning Director, and notice thereof shall be mailed to the applicant, all parties to the matter as established under CDC [99.140](#), and those persons who requested copies of such notice.

B. The final decision by the Planning Commission, Historic Review Board, or City Council shall be filed in the records of the Community Development Department, and notice thereof shall be mailed to the applicant, all parties to the matter as established under CDC [99.140](#), and those people requesting copies of such notice.

C. Notice of a final decision shall conform to applicable provisions of the Oregon Revised Statutes.

D. The appeal period is as provided in CDC [99.230](#). (Ord. [1474](#), 2001; Ord. [1568](#), 2008; Ord. [1590](#) § 1, 2009; Ord. [1621](#) § 25, 2014)

**Finding:** The applicant acknowledges the requirements for notice of final decision by the Planning Director and Planning Commission.

## 99.140 ESTABLISHING STANDING TO APPEAL

A. Any person or recognized neighborhood association with standing may pursue an appeal or seek review of any land development decision. Standing is established in the following way:

B. The person or recognized neighborhood association appeared before an approval authority other than the Director, either orally or in writing, and provided their name and address; signed the testimony form provided at the hearing; or submitted comments to the Director, in writing, and provided their name and address to the Director regarding a decision. Neighborhood association standing can only be established by a person identifying, either in testimony or in writing, that they represent a specific neighborhood association. (Ord. [1474](#), 2001; Ord. [1568](#), 2008; Ord. [1622](#) § 8, 2014)

**Finding:** The applicant understands the right and procedure to establish standing to appeal.

## 99.160 DECISION BY DIRECTOR

A. Pursuant to CDC [99.060\(A\)](#), the Director is authorized to make certain decisions, and no hearing shall be held except where the Director has an interest in the outcome of the decision, due to some past or present involvement with the applicant or other interested persons or in the property or surrounding property, and cannot render an impartial decision. In such cases, the application shall be reviewed by the Director's designee, and in the event the designee cannot render a decision, the application shall be subject to the jurisdiction of the Planning Commission.

B. A decision made by the Director shall be made in accordance with the provisions of CDC [99.110](#), and a record shall be made which shall include:

1. A copy of the application and all supporting information, plans, exhibits, graphics, etc.;
2. All correspondence relating to the application;
3. All information considered by the Director in making the decision;
4. The staff report of the Director prepared under CDC [99.040\(A\)\(3\)\(c\)](#);
5. A list of the conditions, if any are attached, to the approval of the application;
6. A copy of the notice which was given pursuant to CDC [99.080\(A\)](#), and accompanying affidavits, and a list of all persons who were given mailed notice; and

7. A signed statement by the Director stating the nature of any past or present involvement with the applicant, other interested persons or the property if the Director makes a decision, and if there could reasonably be expected to be a challenge to the fairness of the decision.

C. A decision made by the Director shall be final as provided by CDC [99.230](#) unless:

1. A party to the action files a written appeal with the Director within 14 days of the final decision pursuant to CDC [99.240](#); or

2. A majority of the members of the Commission or the Council order a review within 14 days of the final decision pursuant to CDC [99.240](#).

D. No Director's decision may modify the request from that set out in the notice given under CDC [99.080](#) and [99.090](#), unless new notice be given, except that conditions may be attached to the approval. (Ord. [1568](#), 2008; Ord. [1622](#) § 6, 2014; Ord. [1635](#) § 41, 2014)

**Finding:** The applicant understands and acknowledges the Director's final decision process and requirements.

## 2.8 West Linn Comprehensive Plan

### GOAL 1: CITIZEN INVOLVEMENT

Policies:

4. Provide timely and adequate notice of proposed land use matters to the public to ensure that all citizens have an opportunity to be heard on issues and actions that affect them.

**Finding:** The Robinwood Neighborhood Association and project neighbors have been given timely notice in compliance with the City of West Linn's standards. A meeting was held with the Robinwood Neighborhood Association on July 23, 2023 to present the project and answer questions.

### GOAL 5: OPEN SPACES, SCENIC AND HISTORIC AREAS AND NATURAL RESOURCES

#### 2. Natural Resources

Policies:

1. Implement site design standards that prescribe how to place roadways and buildings to preserve trees.

2. Where appropriate, require the planting of trees as a condition of approval for any land development proposal, consistent with the City's street tree ordinance and recommendations of the City Arborist.

7. Enhance and expand vegetation, particularly native species, on hillsides and in natural areas to prevent erosion and improve wildlife habitat.
8. Require and enforce erosion control standards for new development.
9. Maintain and improve existing storm water detention and treatment standards to ensure that the impact of new development does not degrade water quality and wildlife habitat.

**Finding:** Significant steps have been taken to fulfill the policies of Goal 5.2—Natural Resources:

- Attention has been given in the site design to preserve existing trees wherever possible. Trees to be removed will be replaced following City ordinances and recommendations of the City Arborist. A tree removal permit has already been approved, with documentation provided as in Appendix I in the C.U.P. Application.
- A planting plan is included showing how vegetation will be enhanced on this hillside site to prevent erosion and improve wildlife habitat.
- West Linn’s erosion control standards will be met during construction
- Stormwater capture and conveyance facilities are also designed to meet City standards, to protect water quality and wildlife habitat.

## GOAL 6: AIR, WATER AND LAND RESOURCE QUALITY

### 2. Water Quality

Policies:

1. Require that new development be designed and constructed to prevent degradation of surface and groundwater quality by runoff.
2. Require that City construction projects, maintenance activities, and operating procedures be designed and operated so as to not degrade surface or ground water quality.
3. Recognize the City’s responsibility for operating, planning, and regulating wastewater systems pursuant to the City’s adopted Sanitary Sewer System Master Plan, which is a supporting document to the Comprehensive Plan, as well as agreements with the Clackamas County Water Environment Services Department.
4. Require that new development be connected to the City’s sanitary sewer system.

5. Where feasible, use open, naturally vegetated drainageways to reduce stormwater runoff and improve water quality.
7. Require up to date erosion control plans for all construction and actively enforce applicable City codes and regulations.

**Finding:** The proposed project replaces and upgrades a sewage pump station, an essential facility in protecting water quality and public health that supports the City's role in implementing the adopted sanitary system master plan.

The project is also designed to prevent degradation of surface and groundwater quality by runoff. Up-to-date erosion control will be used during construction.

#### 4. Noise Control

##### Policies:

1. Require measures to adequately buffer residential developments and other noise sensitive uses that are proposed to be located in noise-congested areas.

**Finding:** The proposed project is not anticipated to generate any off-site noise following construction. The only equipment consists of electric pumps operating in covered wet wells deep underground.

## GOAL 7: AREAS SUBJECT TO NATURAL DISASTERS AND HAZARDS

##### Policies

1. Require development and associated alterations to the surrounding land to be directed away from hazardous areas.
3. Require soils and geologic studies for development in hazardous areas.
4. Promote slope and soil stability and the use of natural drainageways in areas with landslide potential by retaining existing vegetation in those areas to the greatest extent possible.
5. Follow state and regional designations and construction standards regarding earthquake hazards.
6. Retain storage capacity of flood waters by protecting flood plains.
7. Prohibit any alteration to the landscape or development that would result in a rise in elevation of the 100-year flood plain.



8. Minimize impacts to natural vegetation within the flood plain by restricting development and related human activity.
12. Refer to current seismic information during development review, including in the pre-application meeting, and when enacting new regulations governing the location of structures and land uses.

**Finding:** Policies will be met for Goal 7: Areas Subject to Natural Disasters and Hazards:

- The chief rationale for the proposed project is to relocate an existing sewage pump station out of the Willamette River 100-year flood plain, while preventing any alteration that would result in a rise in elevation in the flood plain. The pump station relocation to a higher elevation will minimize impacts of human activity in the natural disaster area.
- Soils and geologic studies confirm the site is suitable for the proposed project. (See Geotechnical Memorandum and Report—Appendix B.)
- The site design retains and restores natural vegetation and aligns an existing stream to promote slope and soil stability.
- The site is appropriately designated for the project. Construction methods will follow City and State standards.
- Seismic information was referenced in development review and appears in Appendix B of the C.U.P. application.

## GOAL 11: PUBLIC FACILITIES AND SERVICES

### Policies:

1. Establish, as the City's first priority, the maintenance of existing services and infrastructure in all areas within the existing City limits.
4. The City, or entities designated in the future by the City, shall be the primary provider of the following services and facilities:
  - c. Sanitary sewer collection, treatment, and transport
10. Assure all visible public facilities are constructed with attractive design and materials where appropriate.

**Finding:** The proposed project fulfills the City's first priority under Goal 11—maintaining existing services and infrastructure within the existing City limits. The new facility is unobtrusive, almost entirely below ground, with attractive fencing and landscaping.

## CHAPTER 3 SUMMARY AND CONCLUSION

The applicant has provided, through this submittal, evidence to ensure the land use application complies with the requirements for Conditional Use and Floodplain Development provided in the CDC. The pump

station property is extremely limited in terms of the developable area. In order to locate the pump station outside the floodplain to the greatest extent possible, the infrastructure will be relocated to a higher elevation within the existing public right-of-way, and several standards from the R-15 zoning district which are intended for residential uses are difficult to meet.

The new location for the wet well will ensure that all mechanical, electrical, and control infrastructure is farther away from Trillium Creek, and will have a lessor impact to the neighborhood than other alternatives, while still providing safety for the facility from risk of flooding.

## CHAPTER 4 APPENDICES

- A. Plan Set
- B. Geotechnical Memorandum and Report
- C. DEA Memorandum- Natural Resources
- D. Robinwood Neighborhood Association Notice Materials
- E. Hydraulic Analysis and No-Rise Certification
- F. Floodplain Permit and Certification
- G. TVF&R Service Provider Permit Response
- H. Property Owner Authorization
- I. Tree Removal Permit



# Appendix A

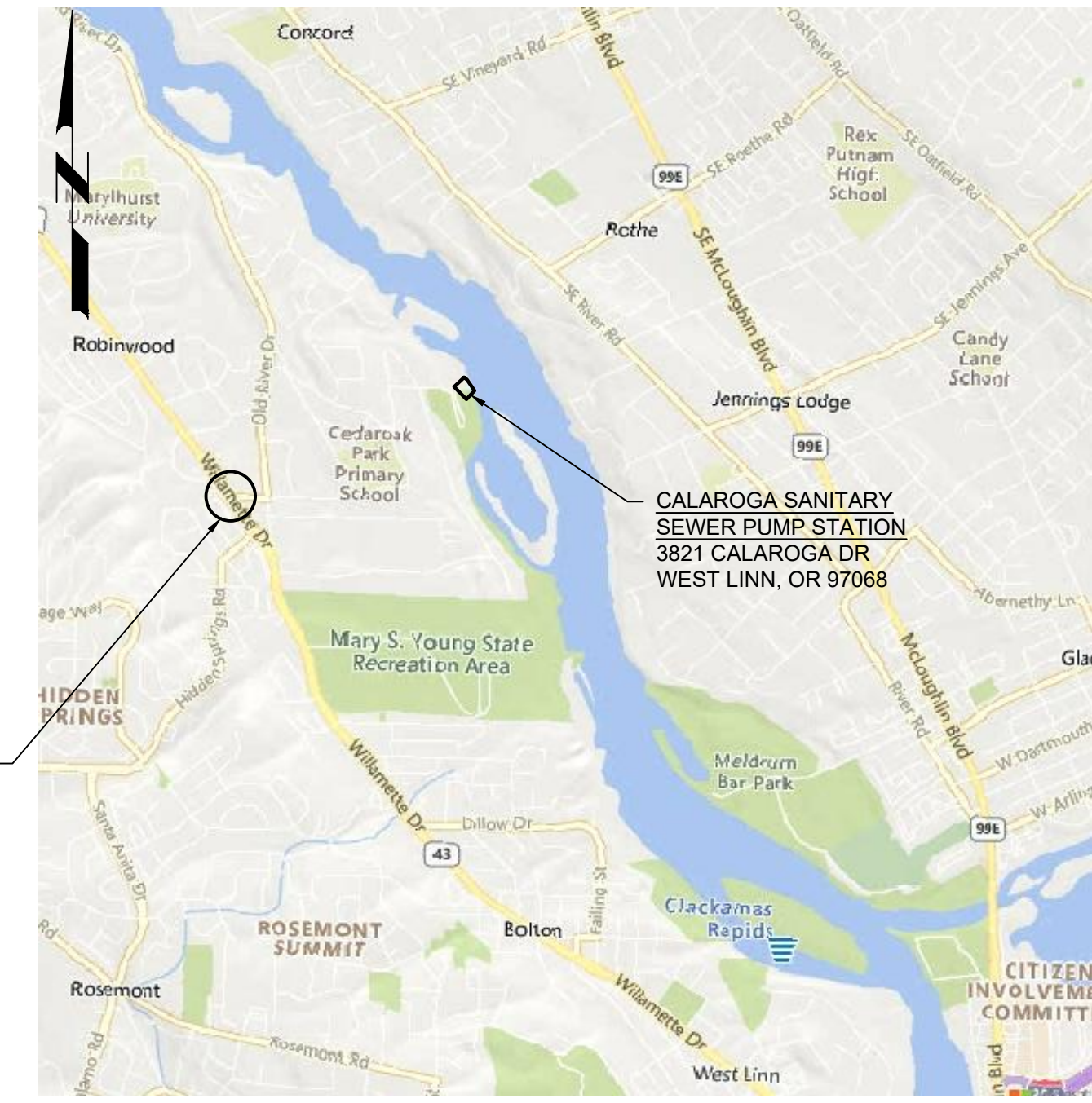
## Plan Set

Plot Date: 10/5/2022 11:10:43 AM



# CITY OF WEST LINN CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT PW-22-05

VOLUME # OF #  
**JULY 2023**



NEAREST BIKE PATH AND TRANSIT ALONG WILLAMETTE DRIVE APPROXIMATELY WHERE SHOWN

VICINITY MAP  
NOT TO SCALE

**CITY OF WEST LINN CONTACT:**  
MARYNA ASUNCION  
ASSOCIATE ENGINEER  
22500 SALAMO RD  
WEST LINN, OR 97068  
MASUNCION@WESTLINNOREGON.GOV  
503-722-3436

**UTILITY CONTACTS:**  
PORTLAND GENERAL ELECTRIC  
800-542-8818

**CAROLLO ENGINEERS CONTACT:**  
CORIANNE BURNETT  
PROJECT MANAGER  
707 SW WASHINGTON ST  
SUITE 5000  
PORTLAND, OR 97205  
CBURNETT@CAROLLO.COM  
503-881-9604

**SURVEY DATUM NOTES:**  
HORIZONTAL DATUM:  
OREGON NORTH STATE PLANE COORDINATE SYSTEM NAD 83 (2011)  
BASED ON GPS OBSERVATIONS TO NGS MONUMENT AND CITY OF WEST LINN CONTROL POINT SHEPHERD, (PID AJ8198) DISTANCES SHOWN HEREON ARE GROUND DISTANCES, INTERNATIONAL FEET, SCALED ABOUT CONTROL POINT NO 1, N=637900.77 E=7652082.03, TO CONVERT TO GRID DISTANCES MULTIPLY BY THE COMBINED FACTOR OF 0.999903641886

**VERTICAL DATUM:**  
BASED ON GPS OBSERVATIONS TO NGS MONUMENT AND CITY OF WEST LINN CONTROL POINT SHEPHERD, (PID AJ8198) THIS NGS MONUMENT IS NOT AN OFFICIAL VERTICAL BENCHMARK BUT ITS VERTICAL POSITION IS REPRESENTED IN THE PROVIDED DATA, AND NOTED AS DERIVED FROM GPS MEASUREMENTS. THE ORTHO HEIGHT PUBLISHED FOR THE FEET UNITS IS NOT UPDATED AND IS ONLY REPRESENTED TO THE NEAREST FOOT. TO OBTAIN A MORE ACCURATE ORTHOMETRIC HEIGHT, THE HIGH-RESOLUTION GEOID HEIGHT OF -22.780 METERS WAS APPLIED WITH THE ELLIPSOID HEIGHT OF 36.545 METERS TO GET A SIGNIFICANTLY HIGHER ACCURACY ORTHOMETRIC HEIGHT OF 59.325 METERS OR 194.64 FEET.



LOCATION MAP



707 SW WASHINGTON STREET  
SUITE 5000  
PORTLAND, OREGON 97205  
PHONE: 503-227-1885 FAX: 503-227-1747



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
GENERAL

COVER SHEET

VERIFY SCALES  
BAR IS ONE INCH ON ORIGINAL DRAWING  
0 1"  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO.  
201779  
DRAWING NO.  
**G01**  
SHEET NO.  
X OF XX

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED	MSS		
DRAWN	CE		
CHECKED	CE		
DATE	JULY 2023		
REV	DATE	BY	DESCRIPTION

LAST SAVED BY: AE/evans

Plot Date: 10/5/2022 11:09:47 AM

LAST SAVED BY: AE/vars

### DRAWING INDEX

### DESIGN CRITERIA

SHT NO.	DWG NO.	DESCRIPTION	SHT NO.	DWG NO.	DESCRIPTION
(G) - GENERAL			(E) - ELECTRICAL		
1	G01	COVER SHEET	27	E01	ELECTRICAL INDEX, ABBREVIATIONS, & SYMBOLS
2	G02	DRAWING INDEX AND DESIGN CRITERIA	28	E02	POWER CONDUIT LAYOUT
3	G03	NOTES AND ABBREVIATION	29	E03	CONTROL CONDUIT LAYOUT
4	G04	GENERAL AND CIVIL LEGEND AND ABBREVIATIONS	30	E04	POWER & CONTROL CONDUIT / CONDUCTOR SCHEDULE
5	G05	SITE PLAN	31	E05	MAIN PANEL MP-1 LAYOUT
			X 32	E06	MAIN PANEL MP-1 BILL OF MATERIALS
			33	E07	ONE-LINE DIAGRAM
(D) - DEMOLITION			(N) - INSTRUMENTATION		
6	D01	SITE PLAN	34	N01	PROCESS & INSTRUMENTATION DRAWING INDEX
		(C) - CIVIL	35	N02	PROCESS & INSTRUMENTATION LEGEND & SYMBOLS
			X 36	N03	-
7	C01	GRADING PLAN	X 37	N04	-
8	C02	DEWATERING, SHORING, AND EXCAVATION PLAN	X 38	N05	-
9	C03	YARD PIPING PLAN	39	N06	WET WELL PROCESS & INSTRUMENTATION DIAGRAM
10	C04	PUMP STATION, VALVE VAULT, AND EXISTING WET WELL PLAN AND SECTIONS	40	N07	VALVE VAULT PROCESS & INSTRUMENTATION DIAGRAM
11	C05	TRAFFIC CONTROL PLAN	X 41	N08	-
12	C06	BYPASS PUMPING PLAN	X 42	N09	-
13	C07	OREGON STANDARD DRAWINGS - TRAFFIC CONTROL	X 43	N10	-
14	C08	OREGON STANDARD DRAWINGS - TRAFFIC CONTROL	X 44	N11	-
15	C09	OREGON STANDARD DRAWINGS - TRAFFIC CONTROL	45	N12	PROCESS & INSTRUMENTATION DRAWING PCP-1 ENCLOSURE
16	C10	CITY OF WEST LINN STANDARD DRAWINGS	46	N13	PROCESS & INSTRUMENTATION DRAWING PCP-1 FRONT AND SUB PANEL LAYOUT
17	ESC01	EROSION AND SEDIMENT CONTROL COVER SHEET	47	N14	PROCESS & INSTRUMENTATION DRAWING PCP-1 TERMINAL BLOCK DETAIL
18	ESC02	EROSION AND SEDIMENT CONTROL SITE PLAN	48	N15	PROCESS & INSTRUMENTATION DRAWING PCP-1 BILL OF MATERIALS
19	ESC03	EROSION AND SEDIMENT CONTROL DETAILS	49	N16	PROCESS & INSTRUMENTATION DRAWING
		(L) - LANDSCAPE	50	N17	PROCESS & INSTRUMENTATION DRAWING PCP-1 CONTROL DRAWING 1
			51	N18	PROCESS & INSTRUMENTATION DRAWING PCP-1 MULTISMART INPUTS
			52	N19	PROCESS & INSTRUMENTATION DRAWING PCP-1 MULTISMART OUTPUTS
20	L01	PLANTING PLAN	53	N20	PROCESS & INSTRUMENTATION DRAWING PCP-1 CONTROL DRAWING 2
21	L02	PLANTING DETAILS	54	N21	PROCESS & INSTRUMENTATION DRAWING PCP-1 INTRINSICALLY SAFE CONTROL
			55	N22	PROCESS & INSTRUMENTATION DRAWING PCP-1 SCADA SYSTEM
			56	N23	TYPICAL DETAILS PAGE 1
			57	N24	TYPICAL DETAILS PAGE 2
		(S) - STRUCTURAL	(T) - TYPICAL DETAILS		
22	GS01	GENERAL STRUCTURAL NOTES			
23	S01	RETAINING WALL PLAN AND SECTIONS	58	TA01	TYPICAL DETAILS - ARCHITECTURAL
24	S02	WET WELL AND VALVE VAULT PLAN AND SECTIONS	59	TC01	TYPICAL DETAILS - CIVIL
25	S03	EXISTING WET WELL PLAN AND SECTION	60	TC02	TYPICAL DETAILS - CIVIL
X 26	S04	RETAINING WALL DETAILS	61	TM01	TYPICAL DETAILS - MECHANICAL
			62	TM02	TYPICAL DETAILS - MECHANICAL
			63	TS01	TYPICAL DETAILS - STRUCTURAL
			64	TS02	TYPICAL DETAILS - STRUCTURAL

CATEGORY	DESCRIPTION/VALUE
Lift Station Design Criteria	
Type	Submersible, Constant Speed
Number of Pumps	Two, one duty and one standby
Rated Pump Capacity	122 gallons per minute
Minimum Inflow	7 gallons per minute
Impeller Type	Hard-Iron
Pump Horsepower	4
Motor Data	230 V, 3 phase, 3600 rpm
Maximum Pump Starts	4 per hour
Wet Well Volume (Lead Pump On/Off)	500 gallons
Wet Well Access Hatch	Double leaf w/fall protection
Lift Station Operating Levels:	
Ground Elevation, ft	47.2
Emergency Overflow Alarm, ft	23.87
High Level Alarm, ft	14.00
Lead Pump On, ft	11.50
Lead Pump Off, ft	9.76
Low Level Alarm, ft	9.53
Impeller Elevation, ft	8.22
Wet Well Floor Elevation, ft	7.50
Overflow Information:	
Overflow Location	Upstream manhole with rim elevation 24.87'. Overflow will enter Trillium Creek.
Wet Well Overflow Storage (High Level Alarm to Emergency Overflow Alarm)	2841 gallons
Average Time to Overflow	23 minutes
Instrumentation, Controls, and Emergency Equipment	
Level Control Type	Multitrode
Telemetry	Cellular
Transfer Switch	Manual
Standby Power, Type	25kW Portable Diesel Engine Generator
Fuel Tank, Capacity	25 gallons, 2.5 hours at 100% load
EPA Reliability Class	1
Flow Meter(s)	None
Force Main	
Size, inches	4
Length, ft	248
Profile	Not provided; existing pipe is majority of forcemain and existing profile indicates constant upward slope (IE 51.99 discharge)
Depth Range, ft	between 4 and 5 feet
Material	Ductile Iron Pipe (new, 38 ft) Asbestos Concrete (exist, 210 ft)
Discharge Manhole	MH 3A-25; Rim El. 58.50
Air Release Valves	None
Vacuum Release Valve	None

X = SHEETS NOT INCLUDED FOR LAND USE SUBMITTAL

**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

DESIGNED	JY
DRAWN	
CHECKED	
DATE	JULY 2023



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
GENERAL

VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. <b>G02</b>
0 1"	SHEET NO. X OF XX
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

DRAWING INDEX AND DESIGN CRITERIA

Plot Date: 10/6/2022 11:06:47 AM

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ABBREVIATIONS

NOTES

Table of abbreviations including symbols like triangles, numbers, and letters with corresponding terms such as DELTA, DEFLECTION ANGLE, FLEXIBLE COUPLING, etc.

GENERAL NOTES:

- List of 20 general notes regarding contract documents, dimensions, construction details, and safety measures.

GENERAL PIPELINE NOTES:

- List of 10 general pipeline notes regarding dimensions, clearances, and construction requirements.

UTILITY NOTES:

- List of 5 utility notes regarding existing utilities, plan locations, and service verification.

EARTHWORK NOTES:

- List of 6 earthwork notes regarding construction area clearing, disposal, and stockpiling.

90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION stamp with revision table (REV, DATE, BY, DESCRIPTION).

DESIGNED, DRAWN, ARE, CHECKED, CE, DATE stamp with date JULY 2023.



CITY OF WEST LINN CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT CIVIL NOTES AND ABBREVIATIONS

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY JOB NO. 201779 DRAWING NO. G03 SHEET NO. X OF XX

Plot Date: 10/5/2022 11:08:46 AM

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### DETAIL REFERENCES

**PLAN**  
SCALE: SCALE  
FILE: FILE  
PLAN NOT REFERENCED

**ELEVATION**  
SCALE: SCALE  
FILE: FILE  
DRAWING CUT ORIGINATION

VIEW TITLE  
DESCRIPTION  
VIEW  
VIEW TITLE

SECTION CUT  
VIEW  
VIEW TITLE  
DESCRIPTION  
VIEW  
VIEW TITLE

SECTION OR DETAIL  
VIEW TITLE  
DESCRIPTION  
VIEW  
VIEW TITLE

TITLE W/ REFERENCE  
DRAWING CUT ORIGINATION

DETAIL CALL-OUT (ENLARGED)

DRAWING REFERENCE  
AREA DESIGNATOR (WHEN APPLICABLE)  
DISCIPLINE DESIGNATOR  
CONSECUTIVE SHEET NUMBER

TYPICAL DETAIL REFERENCE  
TYPICAL DETAIL #

EXTERIOR ELEVATION VIEWS  
ARROW INDICATES POINT OF VIEW

PHOTO LOCATION  
ARROW INDICATES POINT OF VIEW

GRID BUBBLE

MODIFICATION NOTE  
S = STANDARD  
J = JOB SPECIFIC  
R = REVISED  
N = NOTE TO TYPICAL DETAIL USER

SHT X OF X  
SHEETS IN DETAIL

XX/XX/20XX  
DATE CREATED (REVISED)

### LINE WORK

NEW STRUCTURES OR EDGE OF PAVEMENT

EXISTING STRUCTURES (SCREENED)

NEW PIPING (TRIPLE LINES)

NEW PIPING (SINGLE LINE)

EXISTING PIPING (TRIPLE LINES) (SCREENED)

EXISTING PIPING (SINGLE LINE) (SCREENED)

HIDDEN LINE OR TRAIL EDGE

CENTER, MONUMENT, OR SURVEY LINE

GUARDRAIL

EXISTING CONTOURS (SCREENED)

NEW CONTOURS

NEW FENCE

EXISTING FENCE (SCREENED)

REMOVE OR ABANDONED (CROSS HATCHING: FENCE SHOWN AS EXAMPLE)

POWER POLE & LINE

CABLE TV (UNDERGROUND)

FIBER OPTIC

FUEL

NATURAL GAS

UNDERGROUND ELECTRIC

SANITARY SEWER

FORCEMAIN SANITARY SEWER

STORM DRAIN

TELEPHONE

WATER

PROPERTY LINE OR RIGHT OF WAY

SLOPE

NEW ROAD

EXISTING ROAD (SCREENED)

FUTURE ROAD, WATER EDGE OR RIDGE

CURB & GUTTER

CURB

SWALE

FLOWLINE

SHORING

RAILROAD TRACKS

LIMITS OF CONSTRUCTION

SILT FENCE

EASEMENT

EXISTING EASEMENT

CITY LIMITS

EXISTING GRADE (PROFILE)

PROPOSED GRADE (PROFILE)

MATCH LINE

### COORDINATES / ELEVATION

COORDINATES  
N=1600000 E=1000000  
N=XXXXXXXX.XX E=XXXXXXXX.XX

CONTROL POINT  
FG=XX.XX  
ANY SPECIFIC DESIGNATIONS NOTED WILL NEED TO REFER TO ABBREVIATIONS

SPOT ELEVATION  
X 1325.00

EXISTING SPOT ELEVATION

SLOPE CALLOUT  
2:1  
2.0%  
S=0.0020

### ROADWAY / PIPE CURVES

ROADWAY / PIPE CURVE  
(SEE TABLE ON EACH PAVING AND GRADING OR CIVIL PIPING DWG WITH ROADWAY / PIPE CURVES.)

LENGTH  
CURVE NUMBER  
CLOCKWISE ANGLE  
RADIUS  
RADIUS POINT  
PC  
PT  
EDGE OF PAVEMENT OR OUTSIDE FACE OF CURB

### HATCH PATTERNS

AGGREGATE BASE COURSE (ABC)

GRATING

ASPHALT PAVING

LANDSCAPING

(WITH AERIAL)

RIPRAP

BEDROCK

EXISTING/ UNDISTURBED SOIL

CLSM

STRUCTURAL FILL OR BACKFILL

CONCRETE (ALL CLASSES)

STEEL

DRAIN ROCK

STAGING AREA

GRAVEL

TREAD PLATE

### SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	EXISTING CONTROL POINT		CABLE TV		CLEANOUT
	EXISTING MONUMENT		POWER TOWER		AIR RELEASE VALVE
	CONTROL POINT		GATE		BLOW OFF VALVE
	SOIL BORING LOCATIONS		GUARD POST		HOSE BIBB / YARD HYDRANT
	POTHOLE		HEADWALL		SERVICE CONNECTION
	POTHOLE NUMBER		ROCK WALL		BURIED VALVE
	FLOW/SLOPE DIRECTION		SHRUB/HEDGE		FLANGE
	MANHOLE (PLAN)		TREE		BALL VALVE
	MANHOLE (PROFILE)		SIGN/SIGN POST		BUTTERFLY VALVE
	CATCH BASIN		LIGHT		CHECK VALVE
	ELECTRICAL MANHOLE AND PULL BOX		UTILITY POLE		GATE VALVE
	METER BOX		UTILITY POLE GUY WIRE		PLUG VALVE
	PULL BOX		POWER POLE		PIPE CAP OR CONNECTION
	TELEPHONE PEDESTAL		FIRE HYDRANT		REDUCER

BRACKET

BREAK LINE

PIPE BREAK PLAN VIEW

PIPE BREAK CROSS SECTION

SCALE  
0 10' 20' 40'  
SCALE: 1" = 20'

PIPE CONTINUATION (SINGLE LINE)

KEY NOTE

REVISION DELTA

EXISTING ELEVATION  
EX TOW XXXX.X±

ELEVATION  
TOC XXXX.XX

EQUIPMENT/DEVICE KEY TAG

EQUIPMENT/DEVICE NUMBER  
XXX-XX-XXX

PIPE TAG  
\*PIPE SIZE  
X" XXX  
FUTURE PIPING (WHERE APPLICABLE)  
FUTURE  
\*FOR EXISTING PIPING SHOW AS EX SIZE FLOW STREAM

UNDERGROUND/ OVERHEAD WARNING (STATE/REGION SPECIFIC)

**811**  
Know what's below.  
Call before you dig.  
usanorth811.org

NORTH ARROW/  
PLANT NORTH

30.0°  
NORTH  
NORTH  
TRUE  
PLANT

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DESIGNED JY

DRAWN ARE

CHECKED CE

DATE JULY 2023



CITY OF WEST LINN

CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT

GENERAL

GENERAL AND CIVIL LEGEND AND SYMBOLS

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING

0 1" 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779

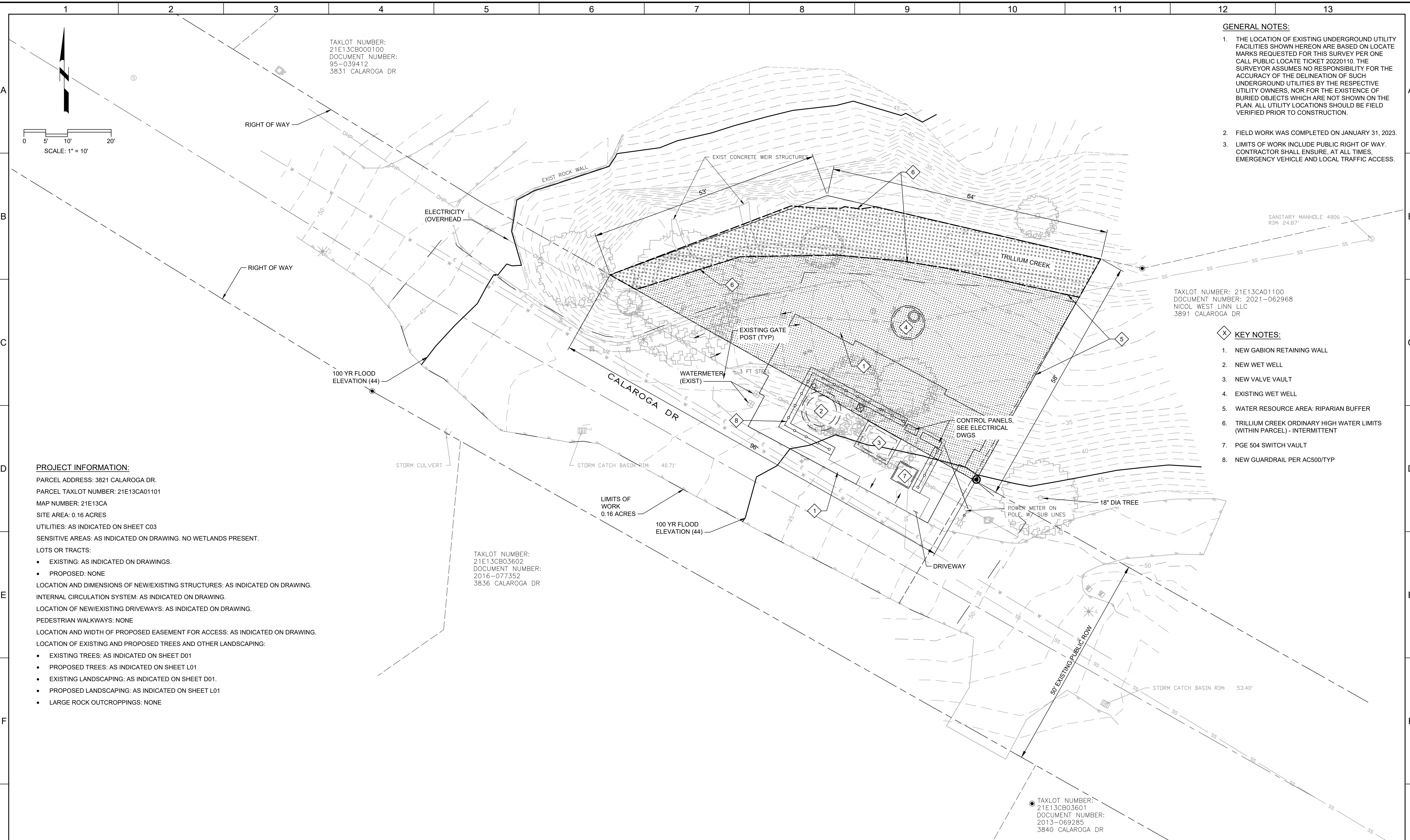
DRAWING NO. G04

SHEET NO. X OF XX



Plot Date: 10/5/2022 11:08:46 AM

LAST SAVED BY: gbamba



TAXLOT NUMBER:  
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DOCUMENT NUMBER:  
95-039412  
3831 CALAROGA DR

TAXLOT NUMBER: 21E13CA01100  
DOCUMENT NUMBER: 2021-062968  
NICOL WEST LINN LLC  
3891 CALAROGA DR

TAXLOT NUMBER:  
21E13CB03602  
DOCUMENT NUMBER:  
2016-077352  
3836 CALAROGA DR

TAXLOT NUMBER:  
21E13CB03601  
DOCUMENT NUMBER:  
2013-069285  
3840 CALAROGA DR

- GENERAL NOTES:**
1. THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS SURVEY PER ONE CALL PUBLIC LOCATE TICKET 20220110. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS, NOR FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  2. FIELD WORK WAS COMPLETED ON JANUARY 31, 2023.
  3. LIMITS OF WORK INCLUDE PUBLIC RIGHT OF WAY. CONTRACTOR SHALL ENSURE, AT ALL TIMES, EMERGENCY VEHICLE AND LOCAL TRAFFIC ACCESS.

- KEY NOTES:**
1. NEW GABION RETAINING WALL
  2. NEW WET WELL
  3. NEW VALVE VAULT
  4. EXISTING WET WELL
  5. WATER RESOURCE AREA: RIPARIAN BUFFER
  6. TRILLIUM CREEK ORDINARY HIGH WATER LIMITS (WITHIN PARCEL) - INTERMITTENT
  7. PGE 504 SWITCH VAULT
  8. NEW GUARDRAIL PER AC500/TYP

**PROJECT INFORMATION:**  
 PARCEL ADDRESS: 3821 CALAROGA DR.  
 PARCEL TAXLOT NUMBER: 21E13CA01101  
 MAP NUMBER: 21E13CA  
 SITE AREA: 0.16 ACRES  
 UTILITIES: AS INDICATED ON SHEET C03  
 SENSITIVE AREAS: AS INDICATED ON DRAWING. NO WETLANDS PRESENT.  
 LOTS OR TRACTS:  
 • EXISTING: AS INDICATED ON DRAWINGS.  
 • PROPOSED: NONE  
 LOCATION AND DIMENSIONS OF NEW/EXISTING STRUCTURES: AS INDICATED ON DRAWING.  
 INTERNAL CIRCULATION SYSTEM: AS INDICATED ON DRAWING.  
 LOCATION OF NEW/EXISTING DRIVEWAYS: AS INDICATED ON DRAWING.  
 PEDESTRIAN WALKWAYS: NONE  
 LOCATION AND WIDTH OF PROPOSED EASEMENT FOR ACCESS: AS INDICATED ON DRAWING.  
 LOCATION OF EXISTING AND PROPOSED TREES AND OTHER LANDSCAPING:  
 • EXISTING TREES: AS INDICATED ON SHEET D01  
 • PROPOSED TREES: AS INDICATED ON SHEET L01  
 • EXISTING LANDSCAPING: AS INDICATED ON SHEET D01.  
 • PROPOSED LANDSCAPING: AS INDICATED ON SHEET L01  
 • LARGE ROCK OUTCROPPINGS: NONE

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED MSS			
DRAWN ARE			
CHECKED			
DATE JULY 2023			
REV	DATE	BY	DESCRIPTION
1			
2			
3			

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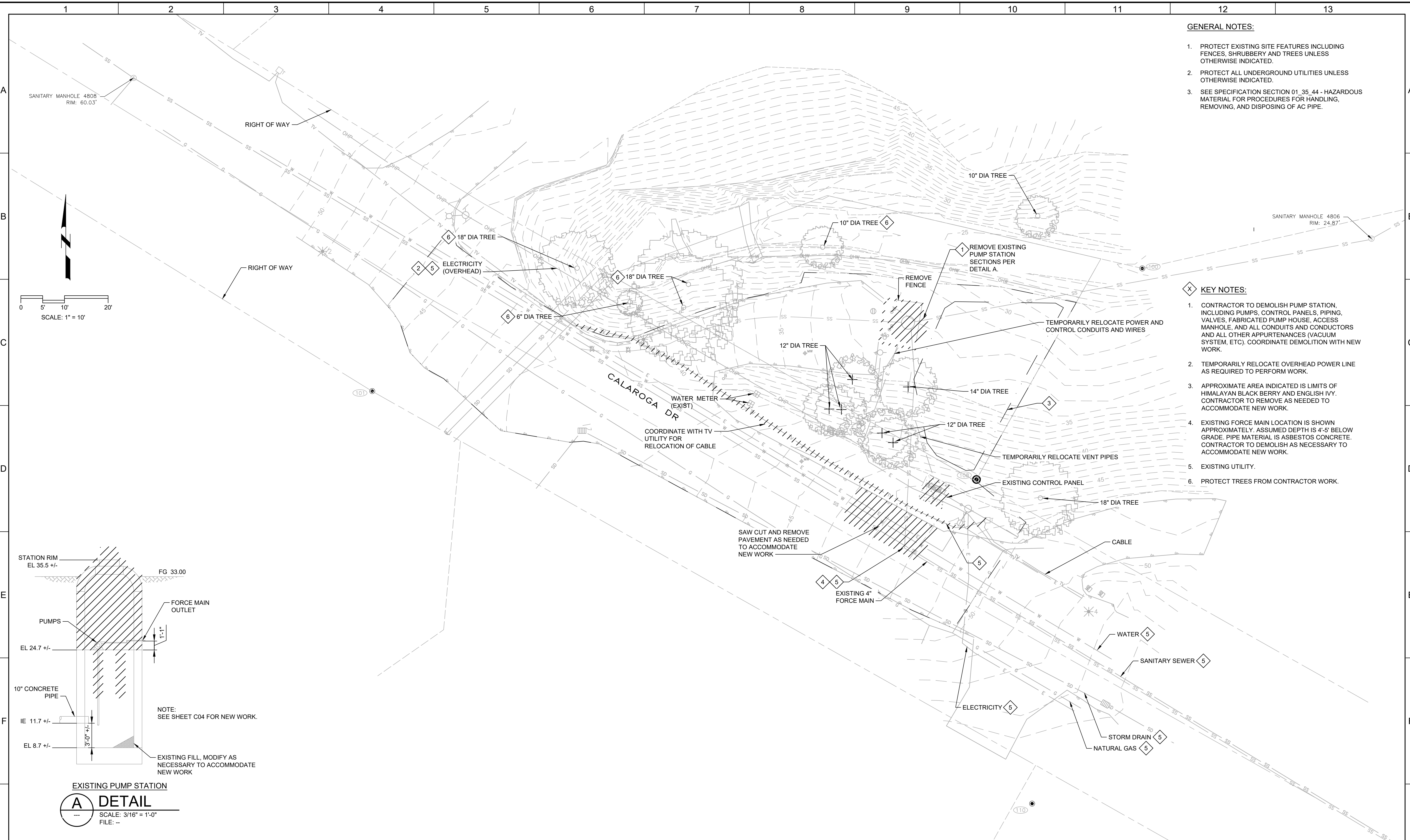


CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 GENERAL  
**SITE PLAN**

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201779 DRAWING NO. <b>G05</b> SHEET NO. X OF XX
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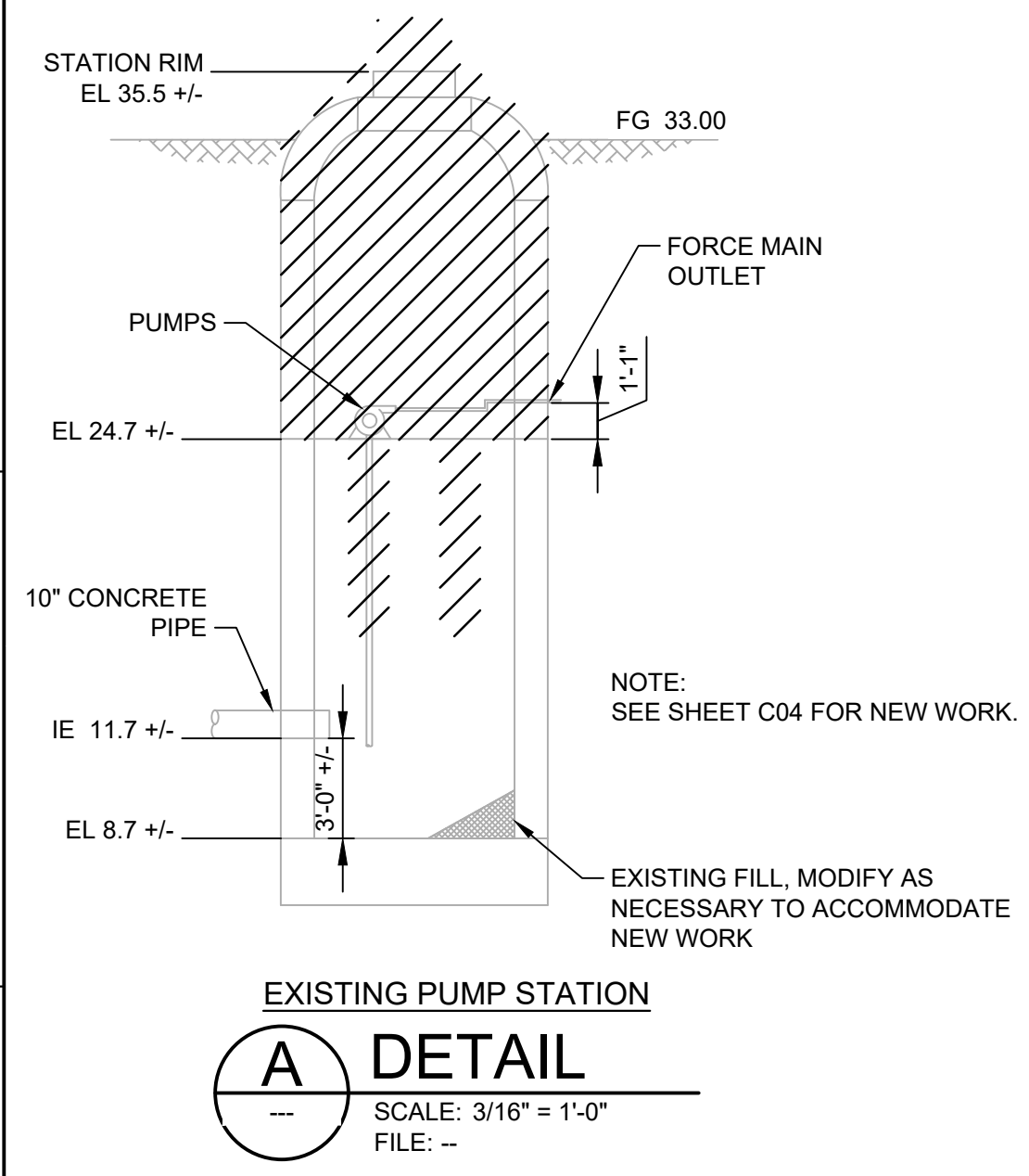
Plot Date: 10/5/2022 11:08:46 AM

LAST SAVED BY: AEVans



- GENERAL NOTES:**
1. PROTECT EXISTING SITE FEATURES INCLUDING FENCES, SHRUBBERY AND TREES UNLESS OTHERWISE INDICATED.
  2. PROTECT ALL UNDERGROUND UTILITIES UNLESS OTHERWISE INDICATED.
  3. SEE SPECIFICATION SECTION 01.35.44 - HAZARDOUS MATERIAL FOR PROCEDURES FOR HANDLING, REMOVING, AND DISPOSING OF AC PIPE.

- KEY NOTES:**
1. CONTRACTOR TO DEMOLISH PUMP STATION, INCLUDING PUMPS, CONTROL PANELS, PIPING, VALVES, FABRICATED PUMP HOUSE, ACCESS MANHOLE, AND ALL CONDUITS AND CONDUCTORS AND ALL OTHER APPURTENANCES (VACUUM SYSTEM, ETC). COORDINATE DEMOLITION WITH NEW WORK.
  2. TEMPORARILY RELOCATE OVERHEAD POWER LINE AS REQUIRED TO PERFORM WORK.
  3. APPROXIMATE AREA INDICATED IS LIMITS OF HIMALAYAN BLACK BERRY AND ENGLISH IVY. CONTRACTOR TO REMOVE AS NEEDED TO ACCOMMODATE NEW WORK.
  4. EXISTING FORCE MAIN LOCATION IS SHOWN APPROXIMATELY. ASSUMED DEPTH IS 4'-5" BELOW GRADE. PIPE MATERIAL IS ASBESTOS CONCRETE. CONTRACTOR TO DEMOLISH AS NECESSARY TO ACCOMMODATE NEW WORK.
  5. EXISTING UTILITY.
  6. PROTECT TREES FROM CONTRACTOR WORK.



**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

REV	DATE	BY	DESCRIPTION
1			
2			

DESIGNED MSS	
DRAWN ARE	
CHECKED	
DATE JULY 2023	



CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 DEMOLITION

**SITE PLAN**

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201779
	DRAWING NO. <b>D01</b>
	SHEET NO. X OF XX

Plot Date: 10/5/2022 11:08:46 AM

- GENERAL NOTES:**
1. THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS SURVEY PER ONE CALL PUBLIC LOCATE TICKET 20220110. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS, NOR FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  2. FIELD WORK WAS COMPLETED ON JANUARY 31, 2023.

- KEY NOTES:**
1. AC PAVING PER CITY OF WEST LINN STANDARD DRAWING "STANDARD STREET CROSS-SECTION COLLECTOR" ON SHEET C10. CURB NOT REQUIRED.

**CUT AND FILL NOTES:**  
 PROPOSED CUT: 95 CY  
 PROPOSED FILL: 360 CY  
 PROPOSED NET CUT/FILL: 265 CY  
 PROPOSED CUT (TO EL 44.0): 95 CY  
 PROPOSED FILL (TO EL 44.0): 200 CY  
 PROPOSED NET CUT/FILL (TO EL 44.0): 105 CY

**TYPE I AND II LAND NOTES:**  
 EXISTING TYPE I AND II LAND AREA: 1,725 SF  
 PROPOSED TYPE I LAND AREA: 890 SF (EXCLUDING RETAINING WALL)  
 EXISTING TYPE II LAND AREA: 0 SF  
 PROPOSED TYPE II LAND AREA: 0 SF

COORDINATE CONTROL POINTS			
POINT	NORTHING	EASTING	ELEVATION
1	637647.46	7653111.26	47.20
2	637639.36	7653118.75	47.20
3	637640.91	7653129.57	47.20
4	637631.92	7653127.18	47.30
5	637633.69	7653133.54	47.30
6	637628.89	7653133.63	0.00
7	637640.51	7653139.89	0.00
8	637657.22	7653109.04	0.00
9	637643.94	7653101.88	0.00
10	637632.43	7653120.31	0.00

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				DRAWN SCR								
				CHECKED								
				DATE JULY 2023								
REV	DATE	BY	DESCRIPTION									
1												

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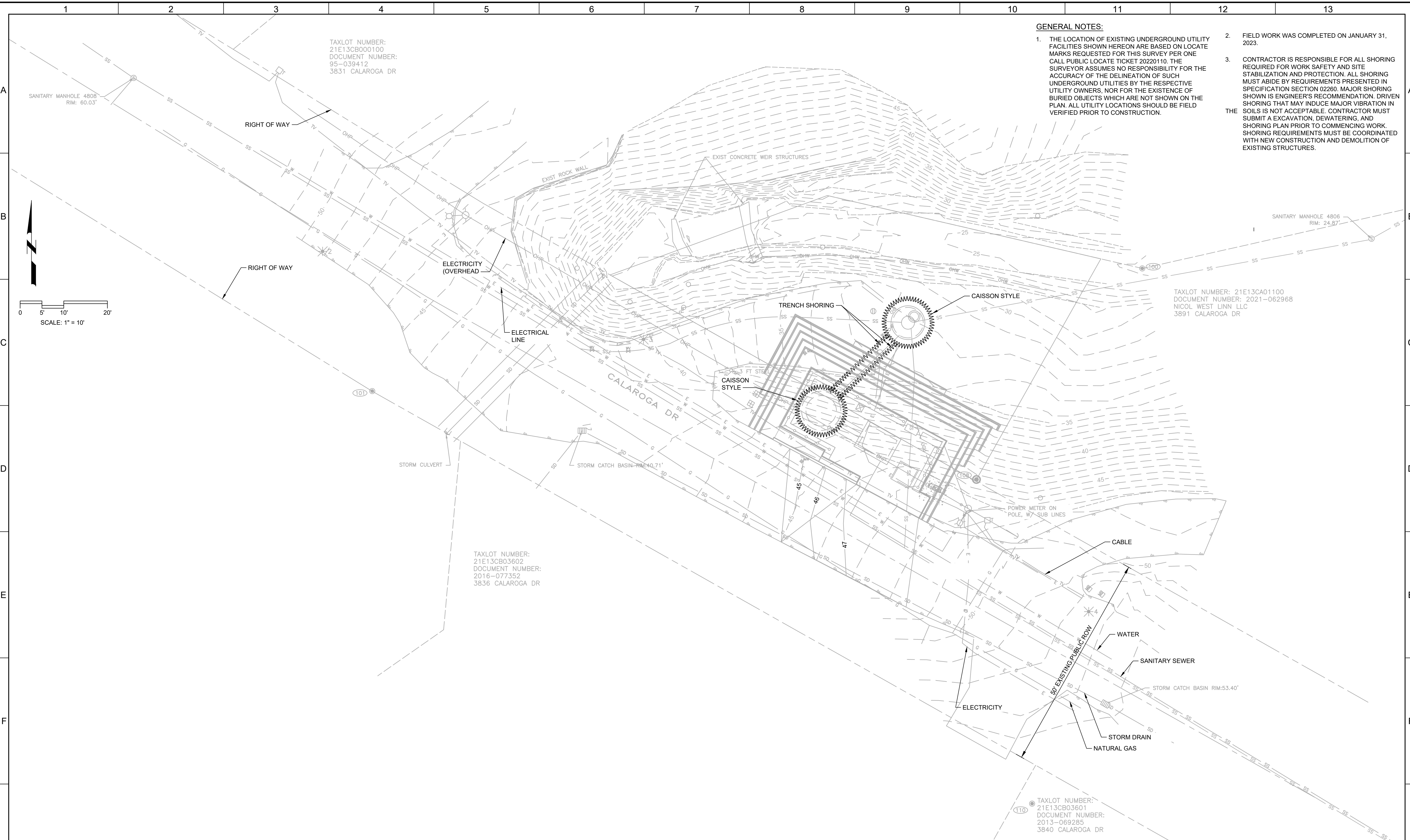


CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 CIVIL  
**GRADING PLAN**

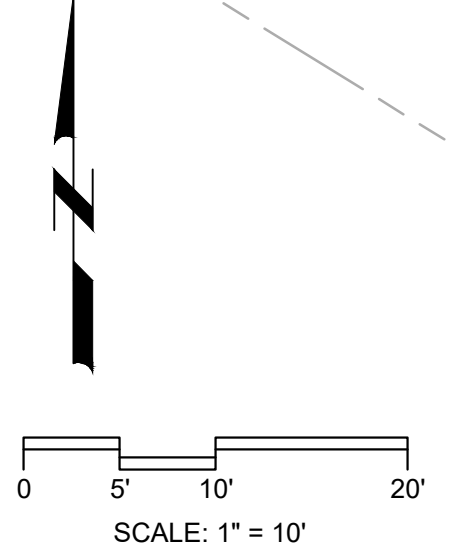
VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. <b>C01</b>
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. X OF XX

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- GENERAL NOTES:**
1. THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS SURVEY PER ONE CALL PUBLIC LOCATE TICKET 20220110. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS. NOR FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  2. FIELD WORK WAS COMPLETED ON JANUARY 31, 2023.
  3. CONTRACTOR IS RESPONSIBLE FOR ALL SHORING REQUIRED FOR WORK SAFETY AND SITE STABILIZATION AND PROTECTION. ALL SHORING MUST ABIDE BY REQUIREMENTS PRESENTED IN SPECIFICATION SECTION 02260. MAJOR SHORING SHOWN IS ENGINEER'S RECOMMENDATION. DRIVEN SHORING THAT MAY INDUCE MAJOR VIBRATION IN THE SOILS IS NOT ACCEPTABLE. CONTRACTOR MUST SUBMIT AN EXCAVATION, DEWATERING, AND SHORING PLAN PRIOR TO COMMENCING WORK. SHORING REQUIREMENTS MUST BE COORDINATED WITH NEW CONSTRUCTION AND DEMOLITION OF EXISTING STRUCTURES.



TAXLOT NUMBER:  
21E13CB000100  
DOCUMENT NUMBER:  
95-039412  
3831 CALAROGA DR

TAXLOT NUMBER: 21E13CA01100  
DOCUMENT NUMBER: 2021-062968  
NICOL WEST LINN LLC  
3891 CALAROGA DR

TAXLOT NUMBER:  
21E13CB03602  
DOCUMENT NUMBER:  
2016-077352  
3836 CALAROGA DR

TAXLOT NUMBER:  
21E13CB03601  
DOCUMENT NUMBER:  
2013-069285  
3840 CALAROGA DR

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>				DESIGNED	MSS
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				DATE	JULY 2023
REV	DATE	BY	DESCRIPTION		
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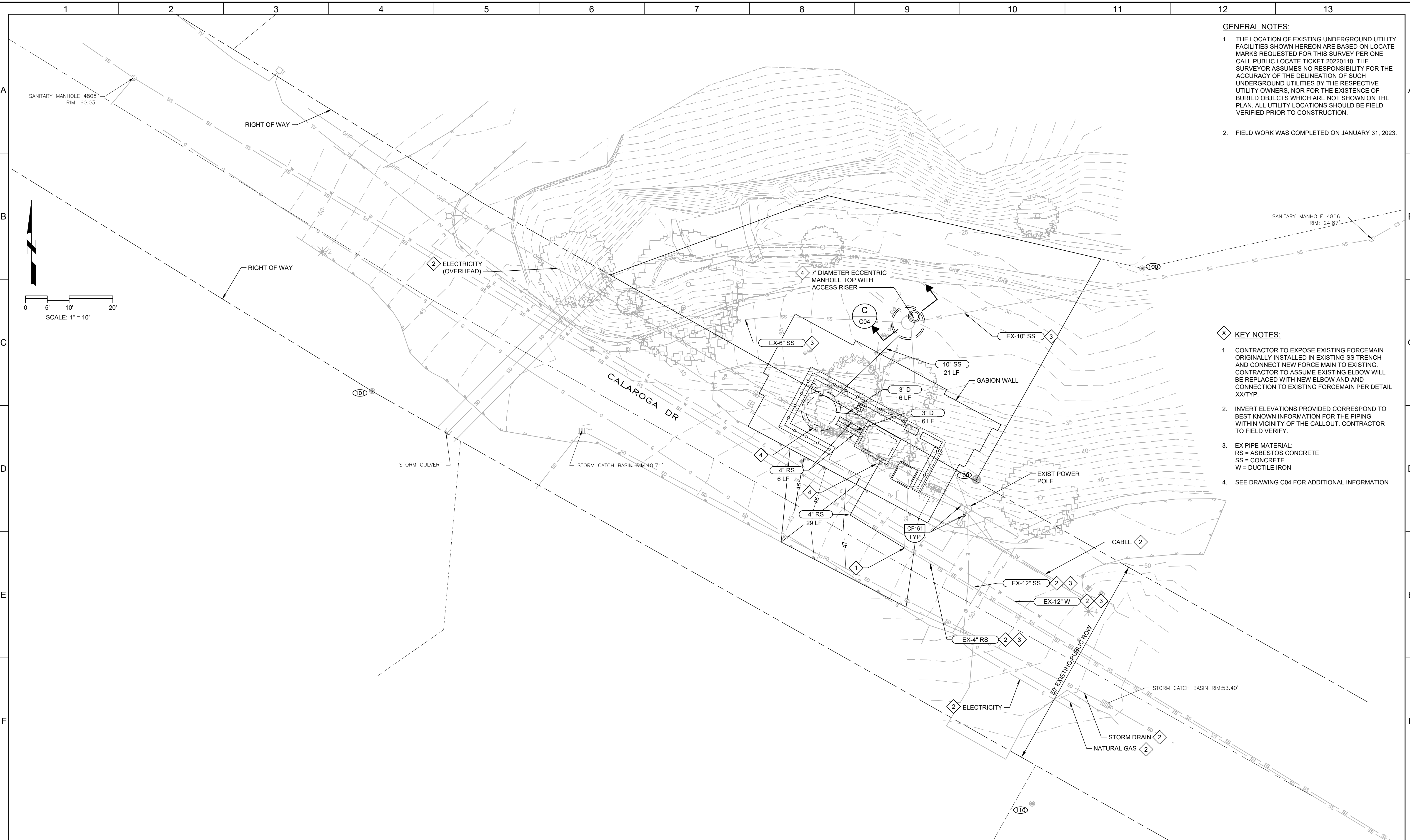


CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT**  
 CIVIL  
**EXCAVATION, SHORING AND DEWATERING PLAN**

VERIFY SCALES	JOB NO.
BAR IS ONE INCH ON ORIGINAL DRAWING	201779
0 1"	DRAWING NO.
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	C02
	SHEET NO.
	X OF XX

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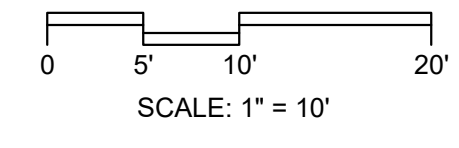


**GENERAL NOTES:**

- THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS SURVEY PER ONE CALL PUBLIC LOCATE TICKET 20220110. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS, NOR FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
- FIELD WORK WAS COMPLETED ON JANUARY 31, 2023.

**KEY NOTES:**

- CONTRACTOR TO EXPOSE EXISTING FORCEMAIN ORIGINALLY INSTALLED IN EXISTING SS TRENCH AND CONNECT NEW FORCE MAIN TO EXISTING. CONTRACTOR TO ASSUME EXISTING ELBOW WILL BE REPLACED WITH NEW ELBOW AND CONNECTION TO EXISTING FORCEMAIN PER DETAIL XX/TYP.
- INVERT ELEVATIONS PROVIDED CORRESPOND TO BEST KNOWN INFORMATION FOR THE PIPING WITHIN VICINITY OF THE CALLOUT. CONTRACTOR TO FIELD VERIFY.
- EX PIPE MATERIAL:  
RS = ASBESTOS CONCRETE  
SS = CONCRETE  
W = DUCTILE IRON
- SEE DRAWING C04 FOR ADDITIONAL INFORMATION



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DESIGNED MSS	DRAWN ARE	CHECKED	DATE
			JULY 2023
REV	DATE	BY	DESCRIPTION

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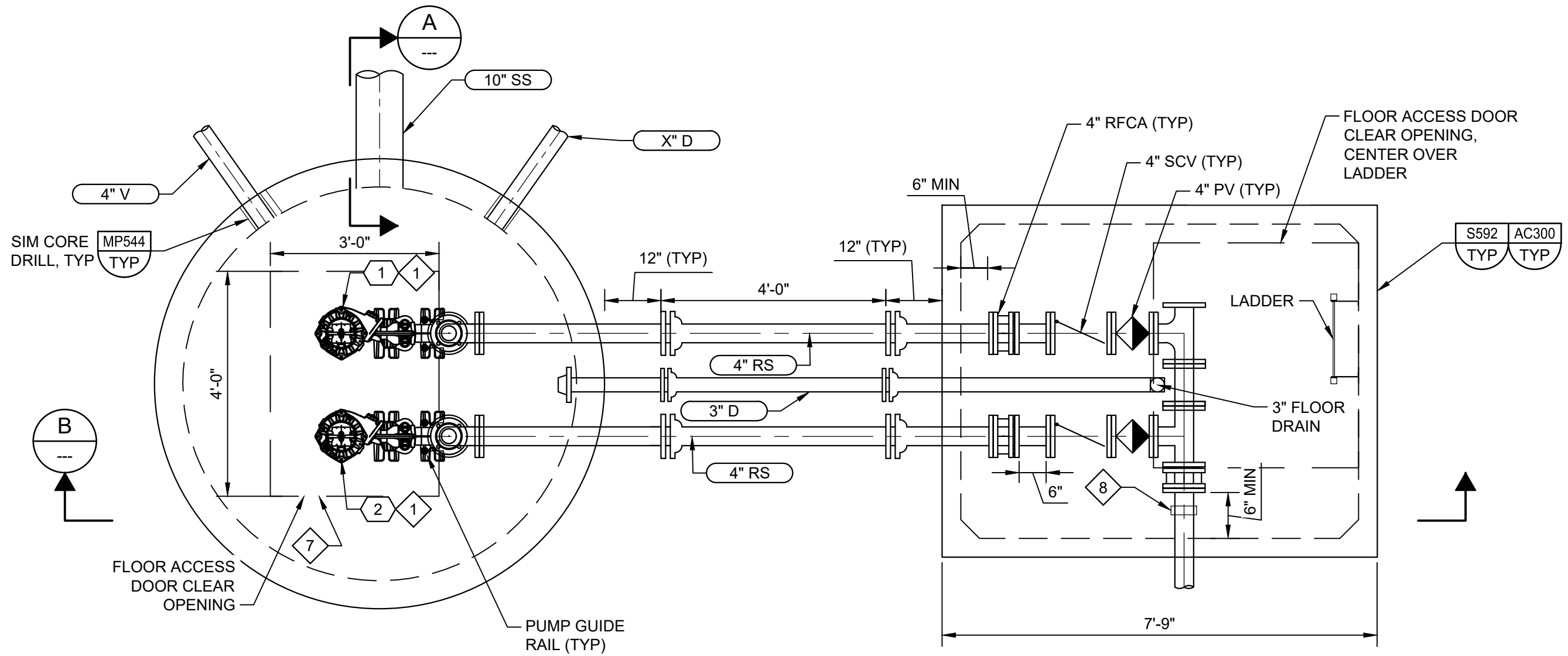
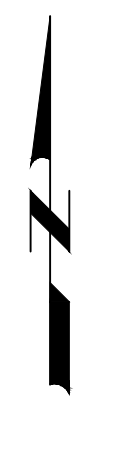
CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT**  
 CIVIL  
**YARD PIPING PLAN**

VERIFY SCALES  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 0 1"  
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

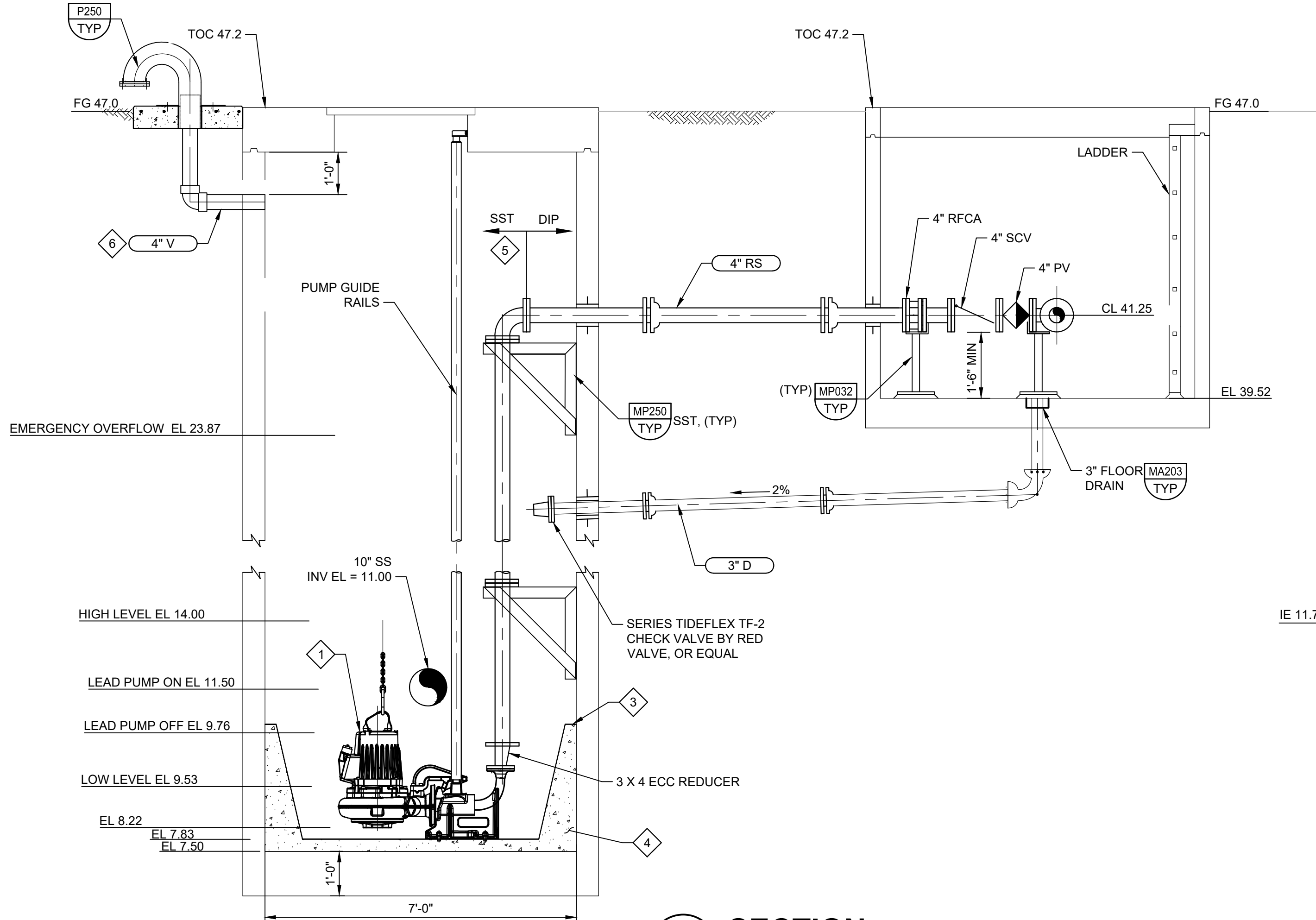
JOB NO. 201779  
 DRAWING NO. C03  
 SHEET NO. X OF XX

Plot Date: 9/12/2022 7:29:07 AM

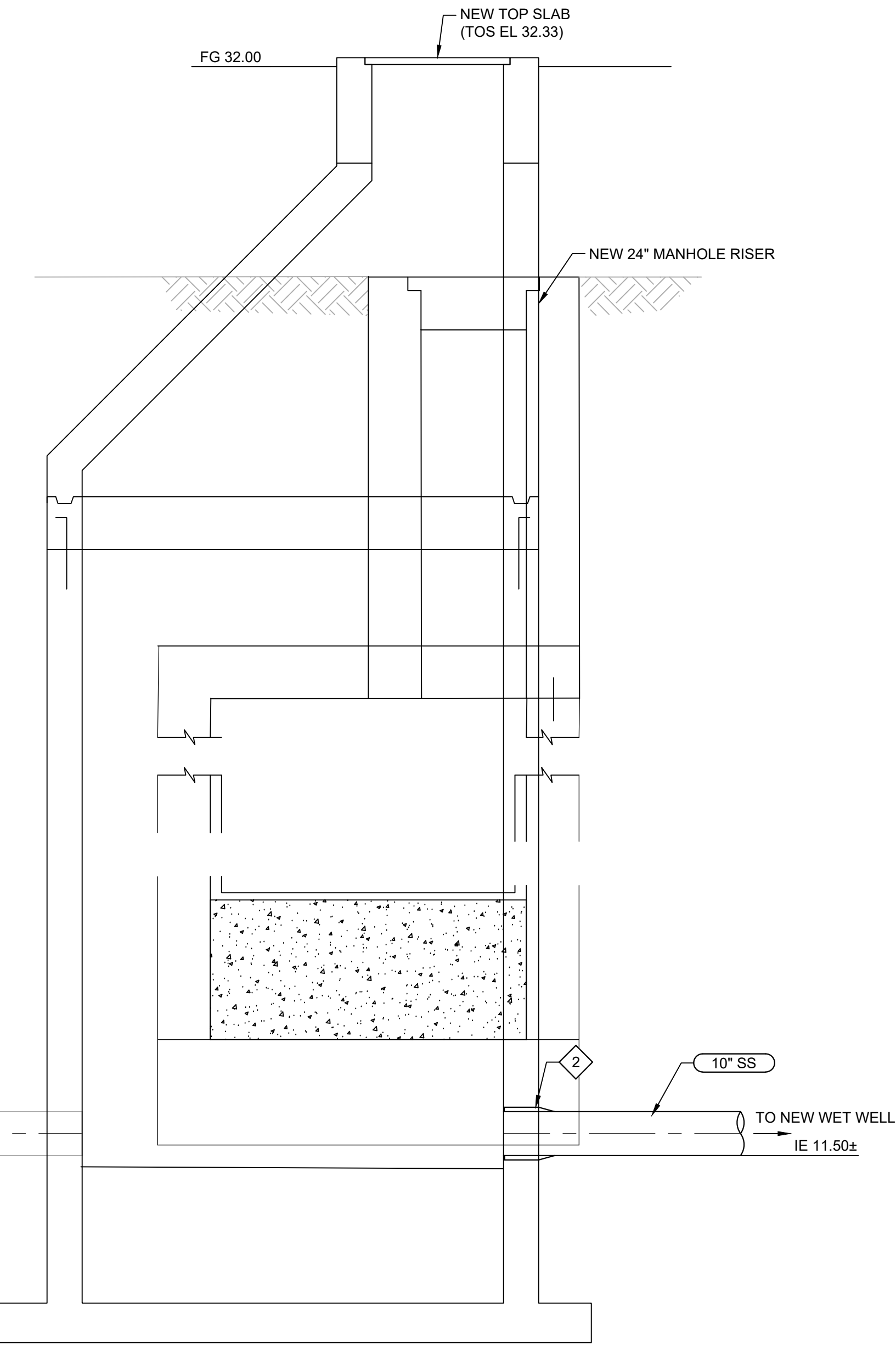
LAST SAVED BY: gbamba



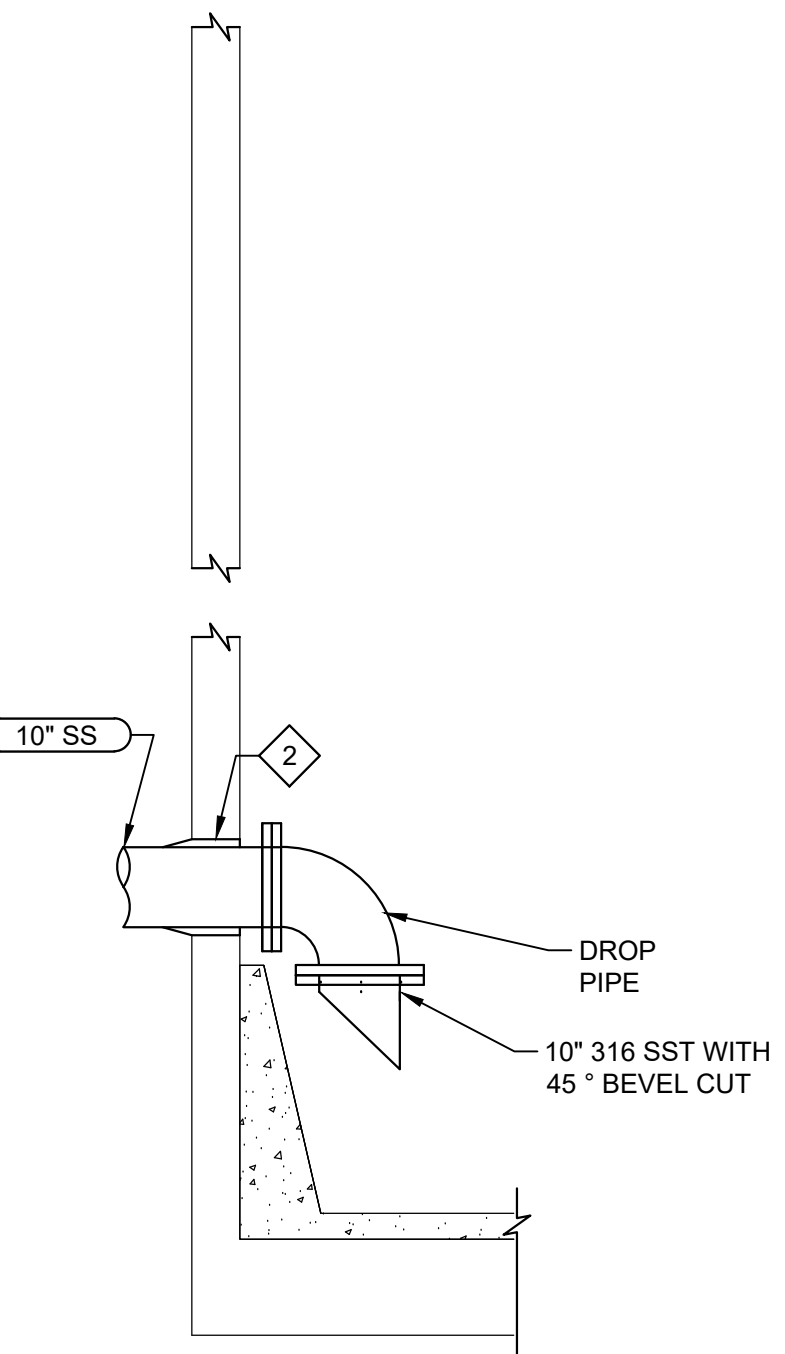
**WET WELL PLAN**  
FILE: FILE: 20177901M101



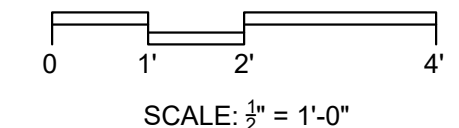
**B SECTION**  
SCALE: 1/2"=1'-0"  
FILE: 8709A12201M306



**C SECTION**  
SCALE: 1/2"=1'-0"  
FILE: 8709A12201M306



**A SECTION**  
SCALE: 3/8"=1'-0"  
FILE: 8709A12201M306



VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1 2 4 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201779 DRAWING NO. <b>C04</b> SHEET NO. X OF XX
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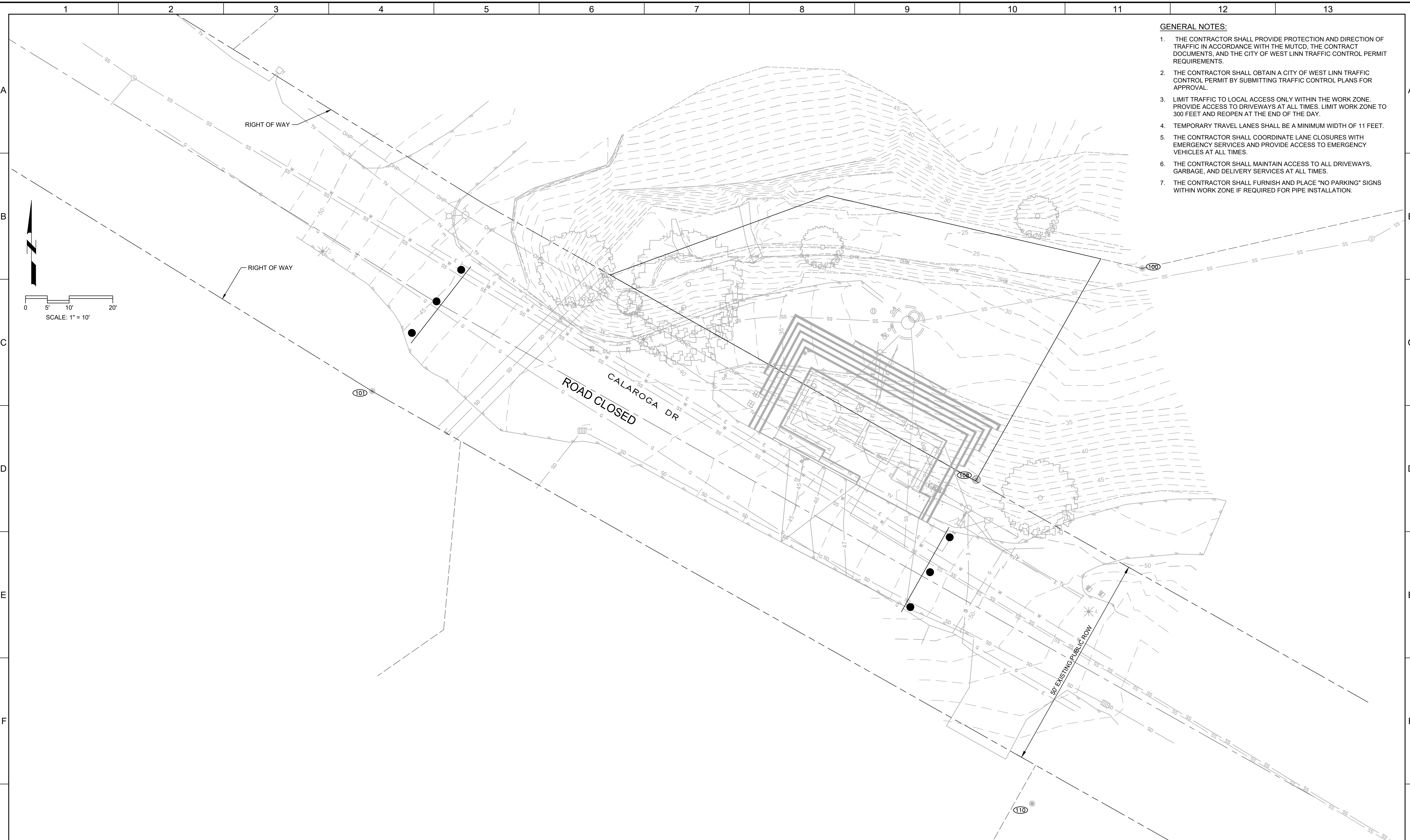
<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED DES	DRAWN DWN	CHECKED CHK	DATE JULY 2023
REV	DATE	BY	DESCRIPTION
1			

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CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT**  
 CIVIL  
**PUMP STATION, VALVE VAULT, AND WET WELL PLAN AND SECTIONS**

Plot Date: 10/5/2022 11:08:46 AM

LAST SAVED BY: AE/vars



- GENERAL NOTES:**
1. THE CONTRACTOR SHALL PROVIDE PROTECTION AND DIRECTION OF TRAFFIC IN ACCORDANCE WITH THE MUTCD, THE CONTRACT DOCUMENTS, AND THE CITY OF WEST LINN TRAFFIC CONTROL PERMIT REQUIREMENTS.
  2. THE CONTRACTOR SHALL OBTAIN A CITY OF WEST LINN TRAFFIC CONTROL PERMIT BY SUBMITTING TRAFFIC CONTROL PLANS FOR APPROVAL.
  3. LIMIT TRAFFIC TO LOCAL ACCESS ONLY WITHIN THE WORK ZONE. PROVIDE ACCESS TO DRIVEWAYS AT ALL TIMES. LIMIT WORK ZONE TO 300 FEET AND REOPEN AT THE END OF THE DAY.
  4. TEMPORARY TRAVEL LANES SHALL BE A MINIMUM WIDTH OF 11 FEET.
  5. THE CONTRACTOR SHALL COORDINATE LANE CLOSURES WITH EMERGENCY SERVICES AND PROVIDE ACCESS TO EMERGENCY VEHICLES AT ALL TIMES.
  6. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS, GARBAGE, AND DELIVERY SERVICES AT ALL TIMES.
  7. THE CONTRACTOR SHALL FURNISH AND PLACE "NO PARKING" SIGNS WITHIN WORK ZONE IF REQUIRED FOR PIPE INSTALLATION.

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED MSS			
DRAWN ARE			
CHECKED			
DATE JULY 2023			
REV	DATE	BY	DESCRIPTION
1			

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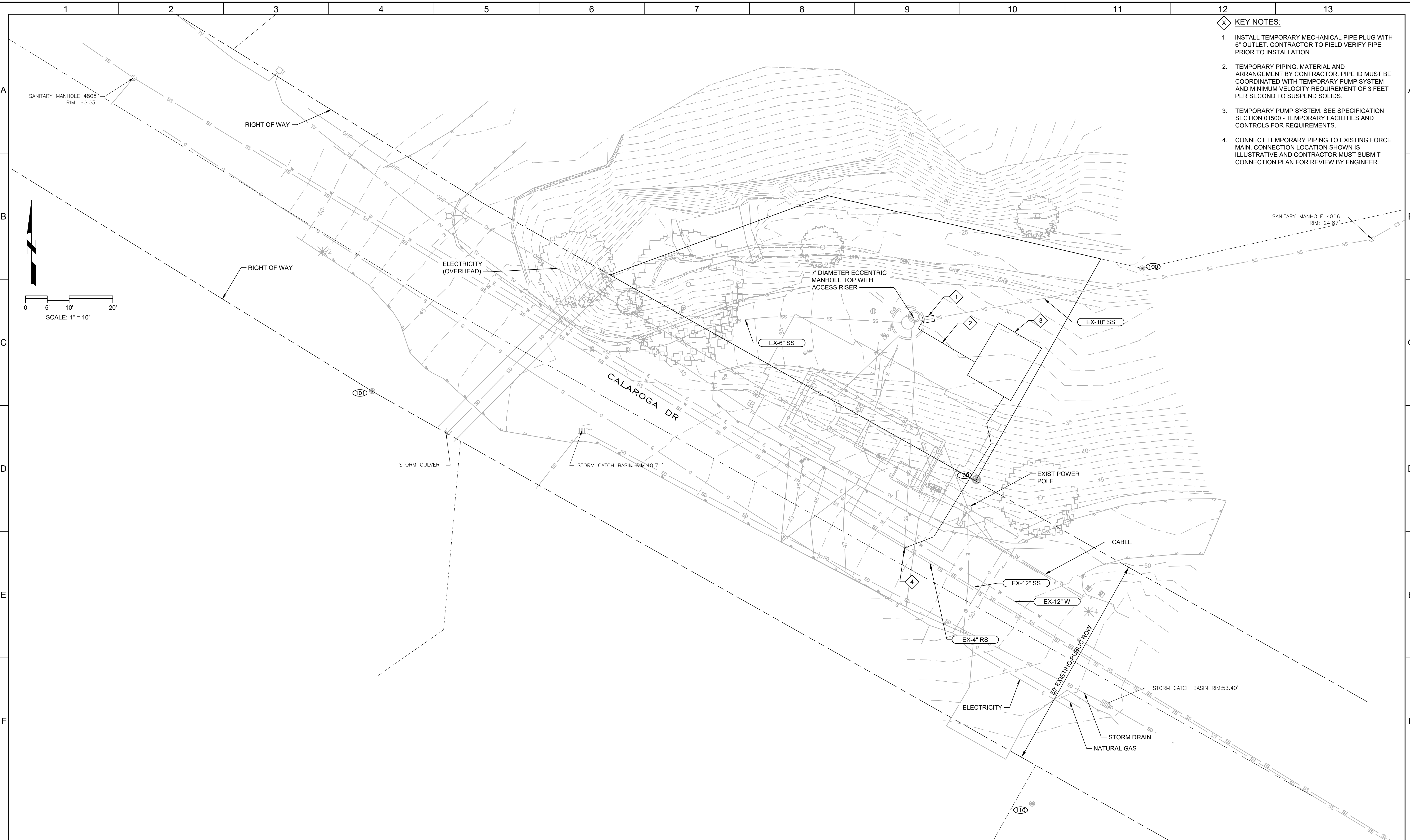
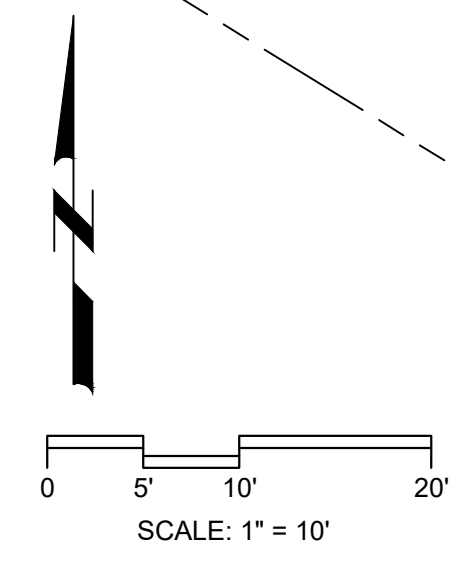
CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 CIVIL

**TRAFFIC CONTROL PLAN**

VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. <b>C05</b>
0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. X OF XX

Plot Date: 10/5/2022 11:08:46 AM

- KEY NOTES:**
1. INSTALL TEMPORARY MECHANICAL PIPE PLUG WITH 6" OUTLET. CONTRACTOR TO FIELD VERIFY PIPE PRIOR TO INSTALLATION.
  2. TEMPORARY PIPING. MATERIAL AND ARRANGEMENT BY CONTRACTOR. PIPE ID MUST BE COORDINATED WITH TEMPORARY PUMP SYSTEM AND MINIMUM VELOCITY REQUIREMENT OF 3 FEET PER SECOND TO SUSPEND SOLIDS.
  3. TEMPORARY PUMP SYSTEM. SEE SPECIFICATION SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS FOR REQUIREMENTS.
  4. CONNECT TEMPORARY PIPING TO EXISTING FORCE MAIN. CONNECTION LOCATION SHOWN IS ILLUSTRATIVE AND CONTRACTOR MUST SUBMIT CONNECTION PLAN FOR REVIEW BY ENGINEER.



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**90% DESIGN  
SUBMITTAL  
NOT FOR  
CONSTRUCTION**

DESIGNED  
MSS  
DRAWN  
ARE  
CHECKED  
  
DATE  
JULY 2023



CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 CIVIL

**BYPASS PUMPING PLAN**

VERIFY SCALES  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 0 1"  
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO.  
201779  
 DRAWING NO.  
**C06**  
 SHEET NO.  
X OF XX



Plot Date: 28-JUL-2023 8:12:03 AM

User: svcPW

01-JUL-2022

TM800.dgn

TM800.dgn

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo\_Sig\_Pen\_v0905.pen PlotScale: 1:1

LAST SAVED BY: AEvans

TAPER TYPES & FORMULAS	
TAPER	FORMULA
Merging (Lane Closure)	"L"
Shifting	"L"/2 or 1/2"L"
Shoulder Closure	"L"/3 or 1/3"L"
Flagging (See Drg. TM850)	50' - 100'
Downstream (Termination)	Varies (See Drawings)

Use Pre-Construction Posted Speed to select the Speed from the Tables below:

TEMPORARY BARRIER FLARE RATE TABLE	
SPEED (mph)	MINIMUM FLARE RATE
30	8:1
35	9:1
40	10:1
45	12:1
50	14:1
55	16:1
60	18:1
65	19:1
70	20:1

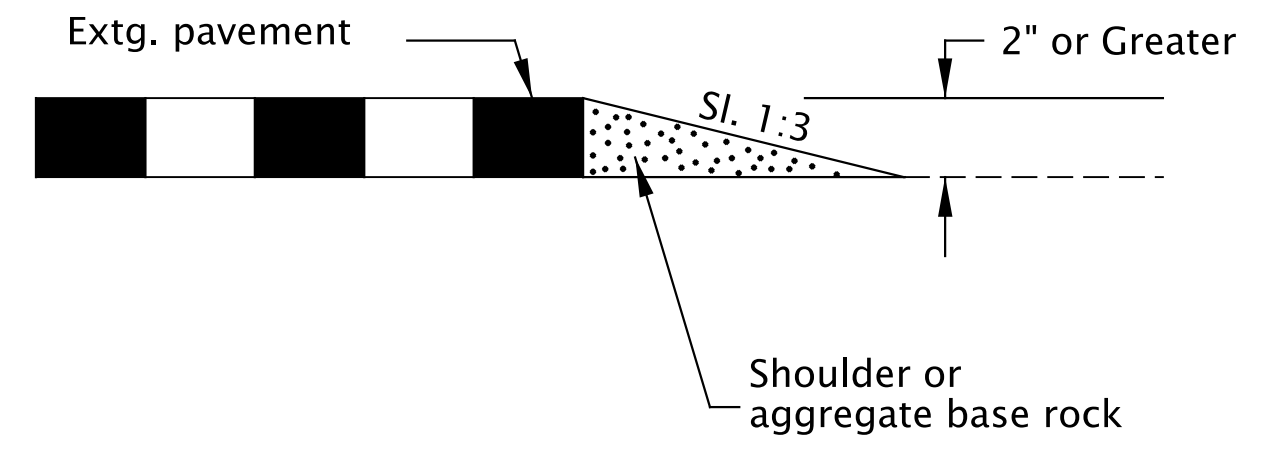
MINIMUM LENGTHS TABLE					
"L" VALUE FOR TAPERS (ft)					BUFFER "B" (ft)
SPEED (mph)	W = Lane or Shoulder Width being closed or shifted				
	W = 10	W = 12	W = 14	W = 16	
25	105	125	145	165	75
30	150	180	210	240	100
35	205	245	285	325	125
40	265	320	375	430	150
45	450	540	630	720	180
50	500	600	700	800	210
55	550	660	770	880	250
60	600	720	840	960	285
65	650	780	910	1000	325
70	700	840	980	1000	365
<b>FREEWAYS</b>					
55	1000	1000	1000	1000	250
60	1000	1000	1000	1000	285
65	1000	1000	1000	1000	325
70	1000	1000	1000	1000	365

- NOTES:
- For Lane closures where W < 10', use "L" value for W = 10'.
  - For Shoulder closures where W < 10', use "L" value for W = 10' or calculate "L" using formula, for Speeds ≥ 45: L = WS, Speeds < 45: L = S W/60, S = Speed, W=Width

TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE				
SPEED (mph)	Sign Spacing (ft)			Max. Channelizing Device Spacing (ft)
	A	B	C	
20 - 30	100	100	100	20
35 - 40	350	350	350	20
45 - 55	500	500	500	40
60 - 70	700	700	700	40
Freeway	1000	1500	2640	40

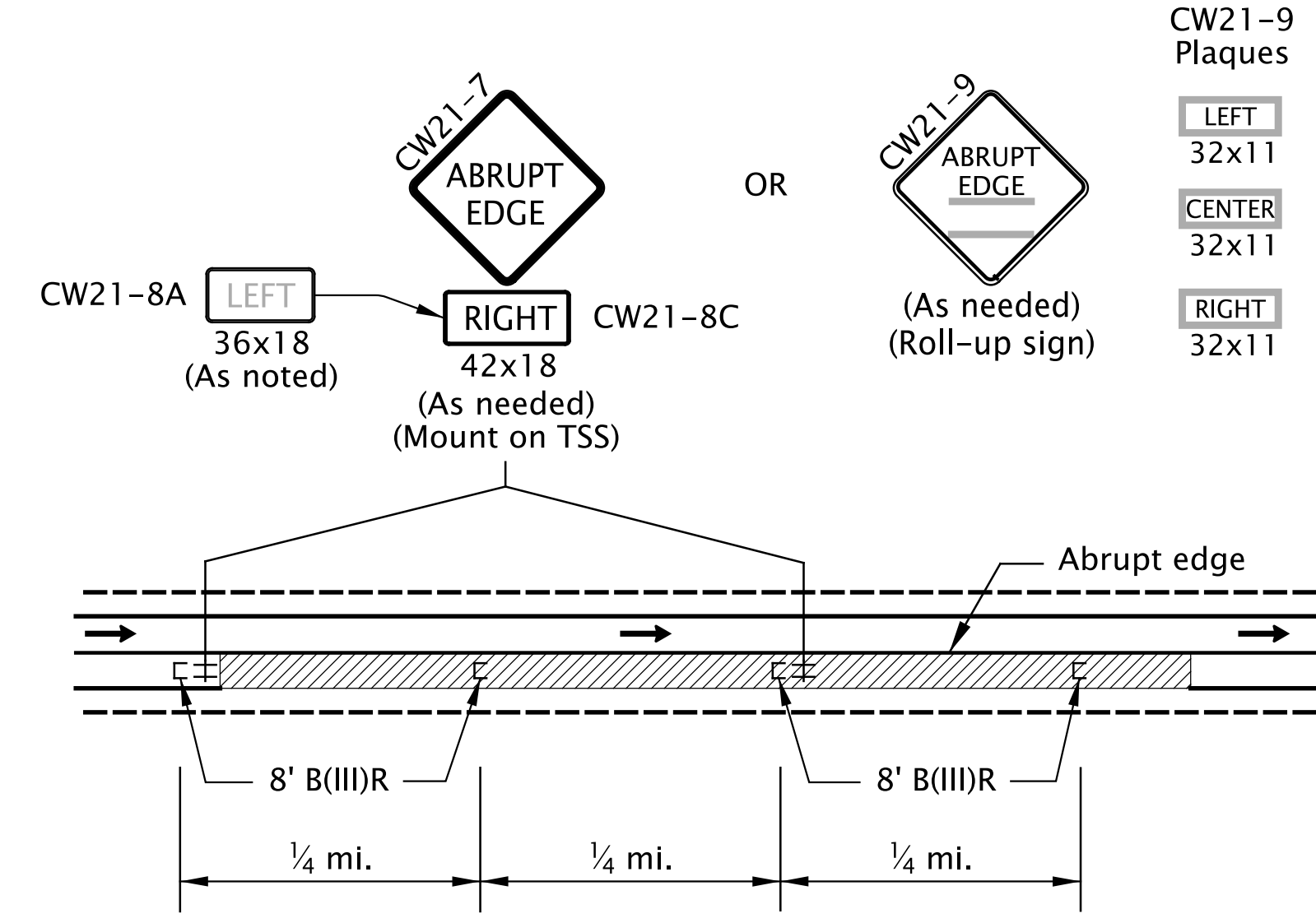
- NOTES:
- Place traffic control devices on 10 ft. spacing for intersection and access radii.
  - When necessary, sign spacing may be adjusted to fit site conditions. Limit spacing adjustments to 30% of the "A" dimension for all speeds.

- NOTES:
- When paved shoulders adjacent to excavations are less than four feet wide protect longitudinal abrupt edge as shown.
  - Use aggregate wedge when abrupt edge is 2 inches or greater.



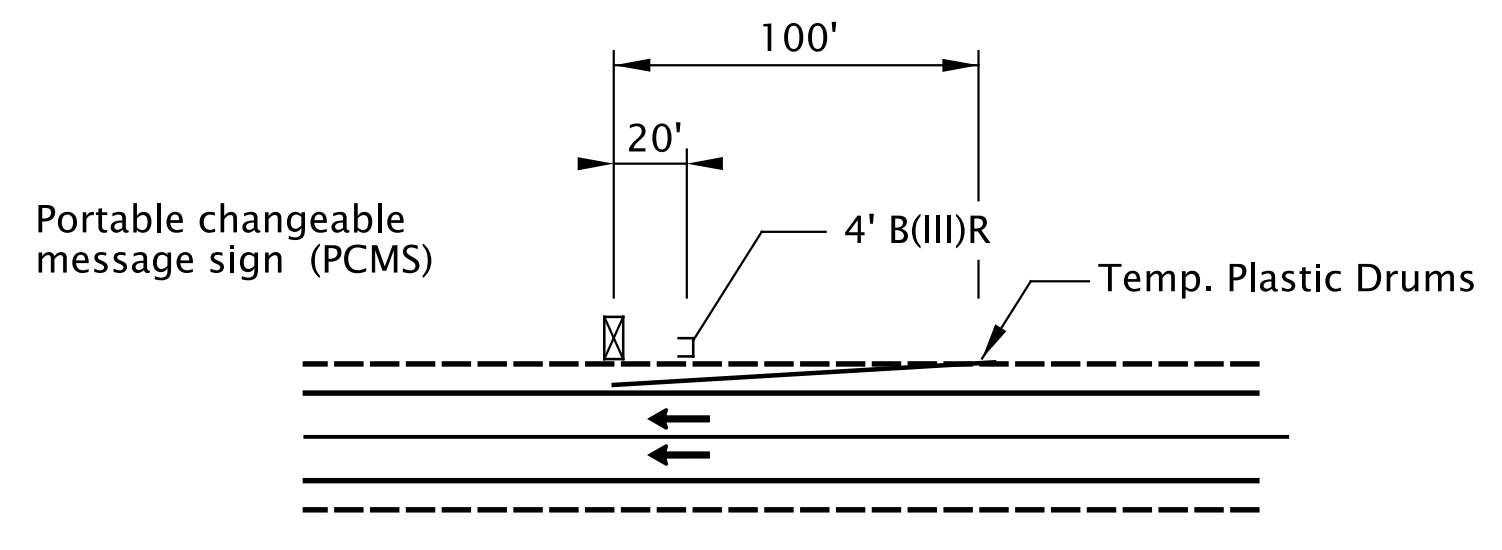
**EXCAVATION ABRUPT EDGE**

- NOTES:
- Abrupt edges may be created by paving, operations, excavations or other roadway work. Use abrupt edge signing for longitudinal abrupt edges of 1 inch or greater.
  - If the excavation is located on left side of traffic, replace the 8' B(III)R barricades with 8' B(III)L barricades and replace the "RIGHT" (CW21-8C) riders with "LEFT" (CW21-8A) riders.
  - Continue signing and other traffic control devices throughout excavation area at spacings shown.
  - If roll-up signs are used, attach the correct (CW21-9) plaques to the sign face using hook and loop fasteners. Place roll-up signs in advance of barricades.



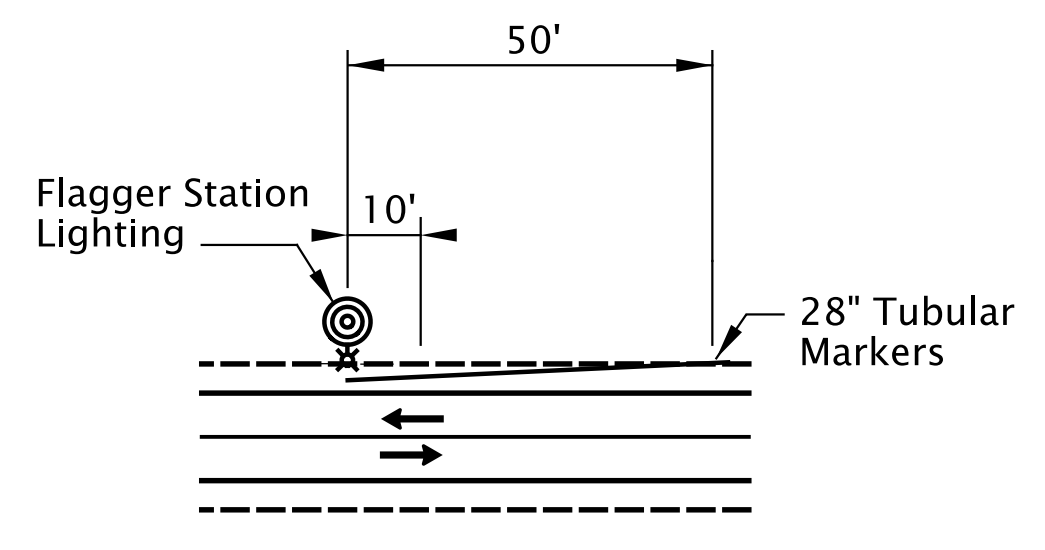
**TYPICAL ABRUPT EDGE DELINEATION**

- NOTES:
- Install PCMS beyond the outside shoulder, when possible.
  - Use the appropriate type of barricade panels for PCMS location. Right shoulder, use Type B(III)R. Left shoulder, use Type B(III)L.
  - Use six drums in shoulder taper on 20' spacing. The drums and barricade may be omitted when PCMS is placed behind a roadside barrier.
  - Detail as shown is used for traileered and non-crashworthy components of:
    - Portable Traffic Signals
    - Smart Work Zone Systems



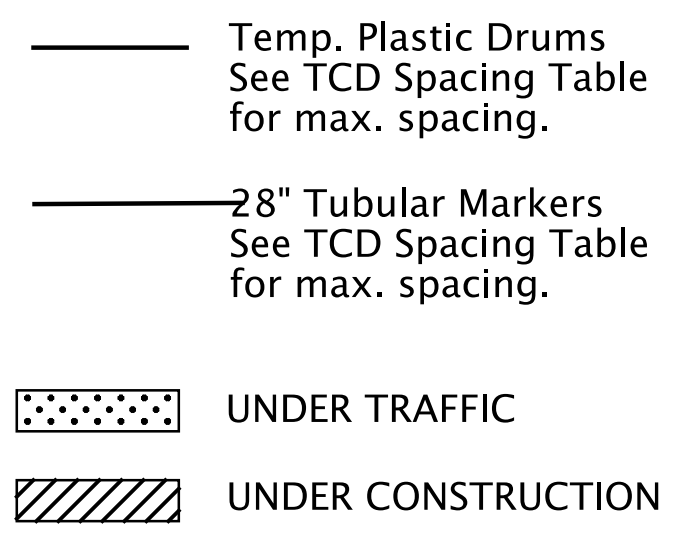
**PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) INSTALLATION**

- NOTES:
- Install Flagger Station Lighting beyond the outside shoulder, where practical.
  - Use six tubular markers in shoulder taper on 10' spacing.
  - Place cart / generator / power supply off of the shoulder, as far as practical.



**FLAGGER STATION LIGHTING DELINEATION**

- GENERAL NOTES FOR ALL TCP DRAWINGS:
- Signs and other Traffic Control Devices (TCD) shown are the minimum required.
  - Place a barricade approx. 20' ahead of all sequential arrow boards.
  - Arrows shown in roadway are directional arrows to indicate traffic movements.
  - All signs are 48" x 48" unless otherwise shown. Use fluorescent orange sheeting for the background of all temporary warning signs.
  - All diamond shaped warning signs mounted on barrier sign supports shall be 36" by 36". All other signs mounted on barrier sign supports shall not exceed 12 sq. ft. in total sign area.
  - Low speed highways have a pre-construction posted speed of 40 mph or less. High speed highways have a pre-construction posted speed of 45 mph or higher.
  - Do not locate sign supports in locations designated for bicycle or pedestrian traffic.
  - Combine drawing details to complete temporary traffic control for each work activity.
  - Coordinate and control pedestrian movements through a Temporary Accessible Route using Flaggers, Traffic Control Measures, or as directed.
  - To be accompanied by Dwg. Nos. TM820 & TM821.



TABLES, ABRUPT EDGE AND PCMS DETAILS

07-2022 Added a note for TPAAs

N/A 01-JUL-2022 **TM800** 0

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED XX	DRAWN XX	CHECKED XX	DATE JULY 2023
REV	DATE	BY	DESCRIPTION
1			
2			
3			
4			

DESIGNED XX
DRAWN XX
CHECKED XX
DATE JULY 2023



CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 CIVIL  
 OREGON STANDARD DRAWINGS  
 TRAFFIC CONTROL

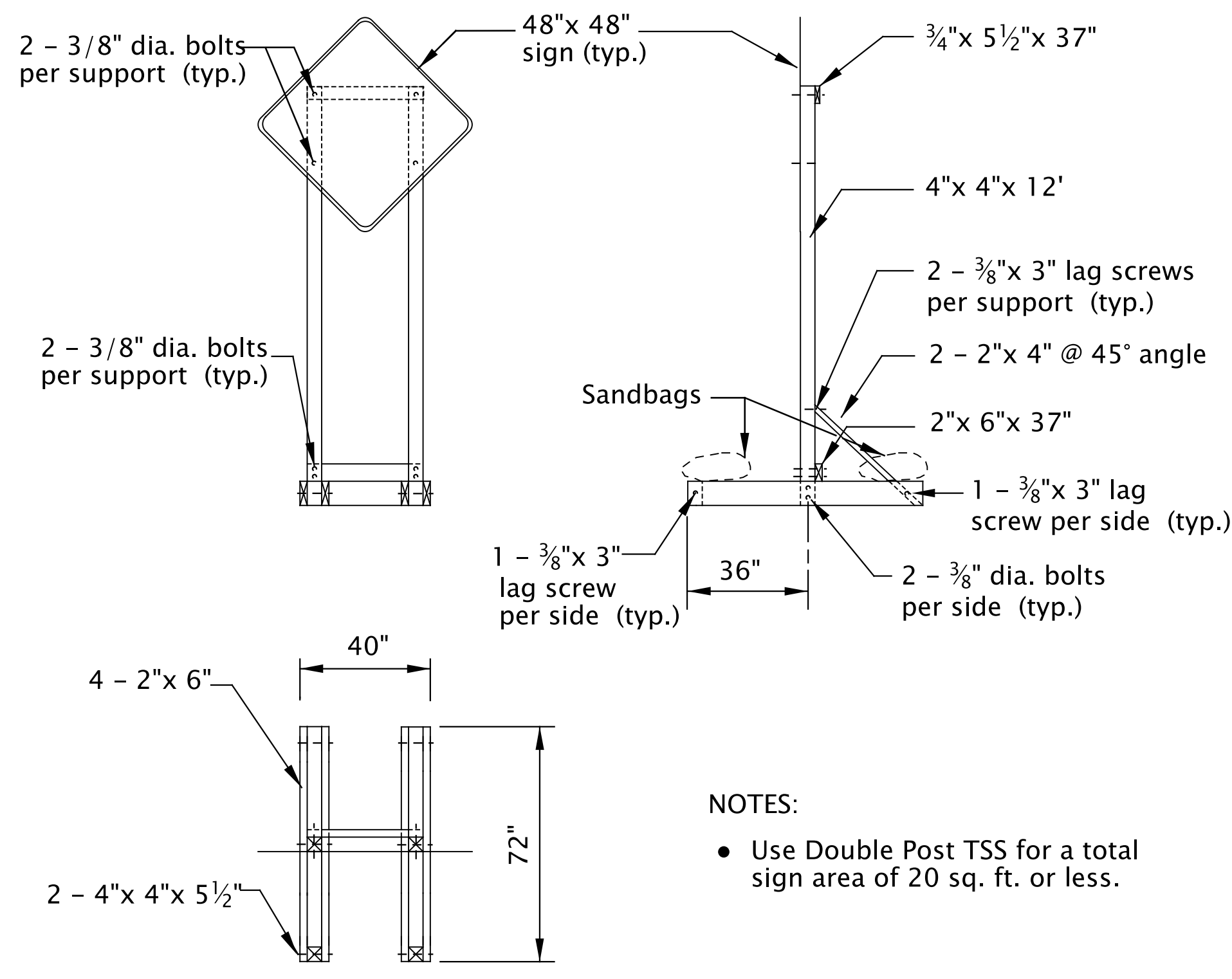
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BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. C07
0 1"	SHEET NO. OF XX
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

Plot Date: 28-JUL-2023 8:11:55 AM

User: svcPW

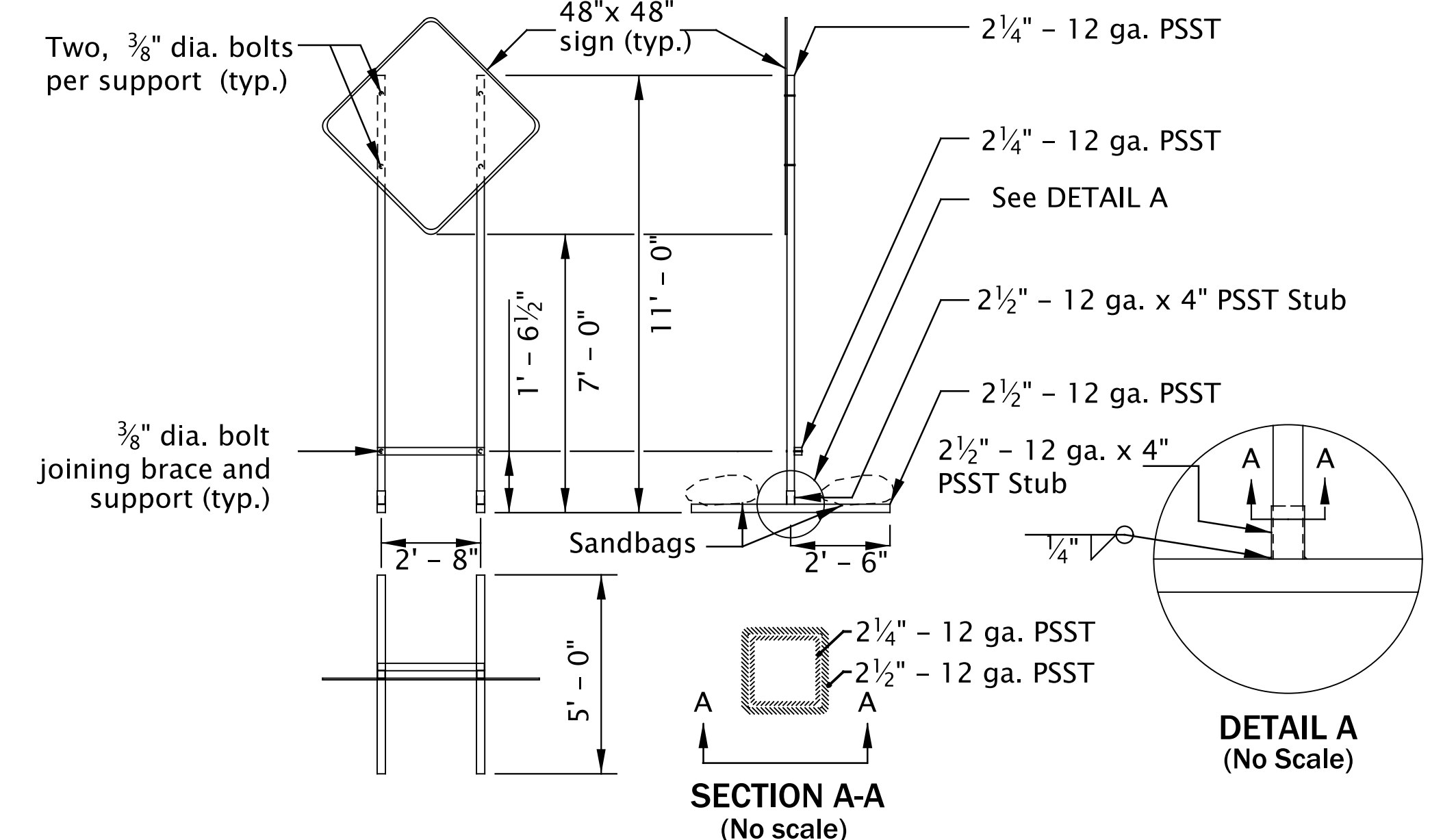
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LAST SAVED BY: AEVans



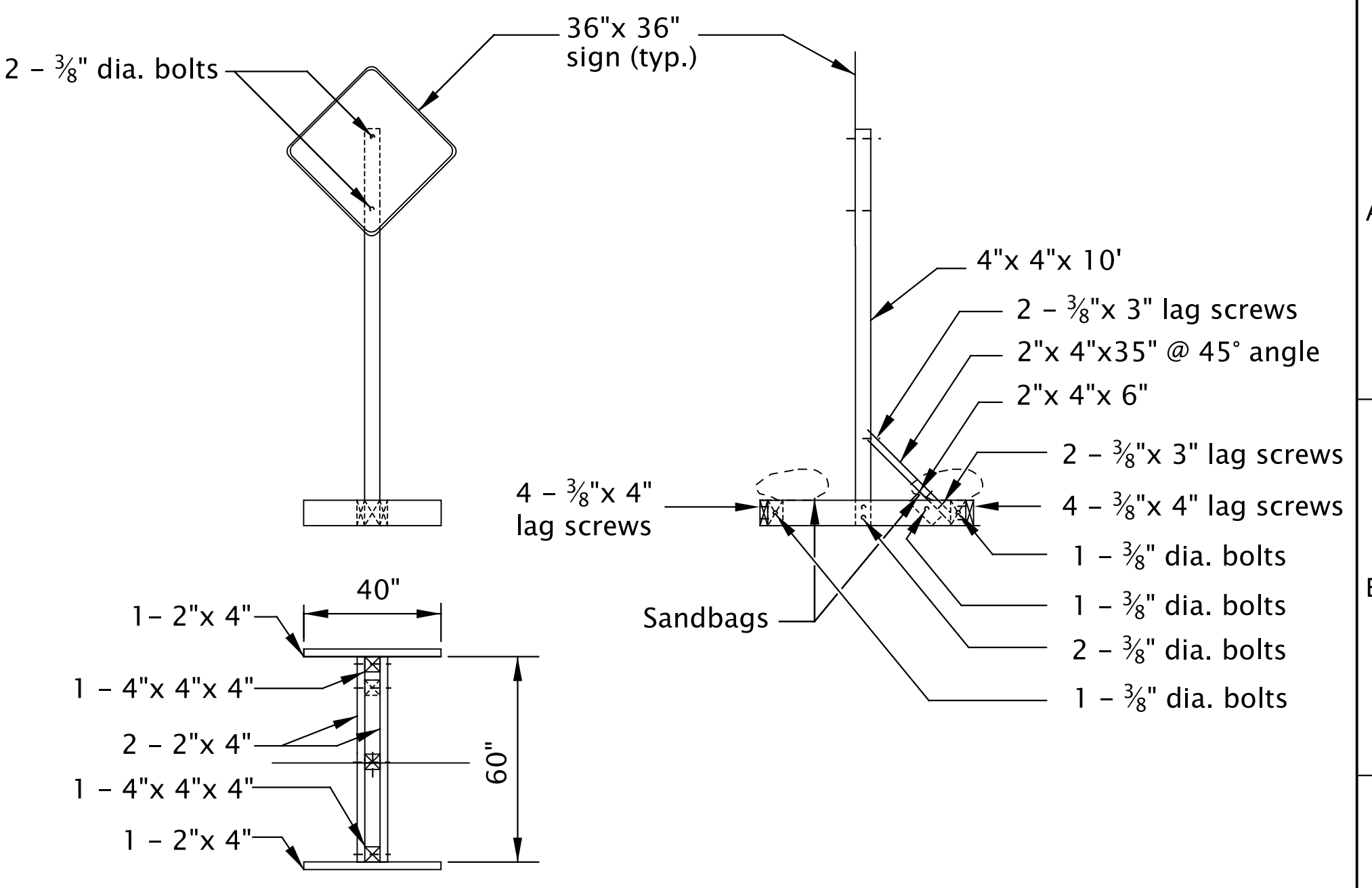
- NOTES:
- Use Double Post TSS for a total sign area of 20 sq. ft. or less.

**DOUBLE POST DETAIL**



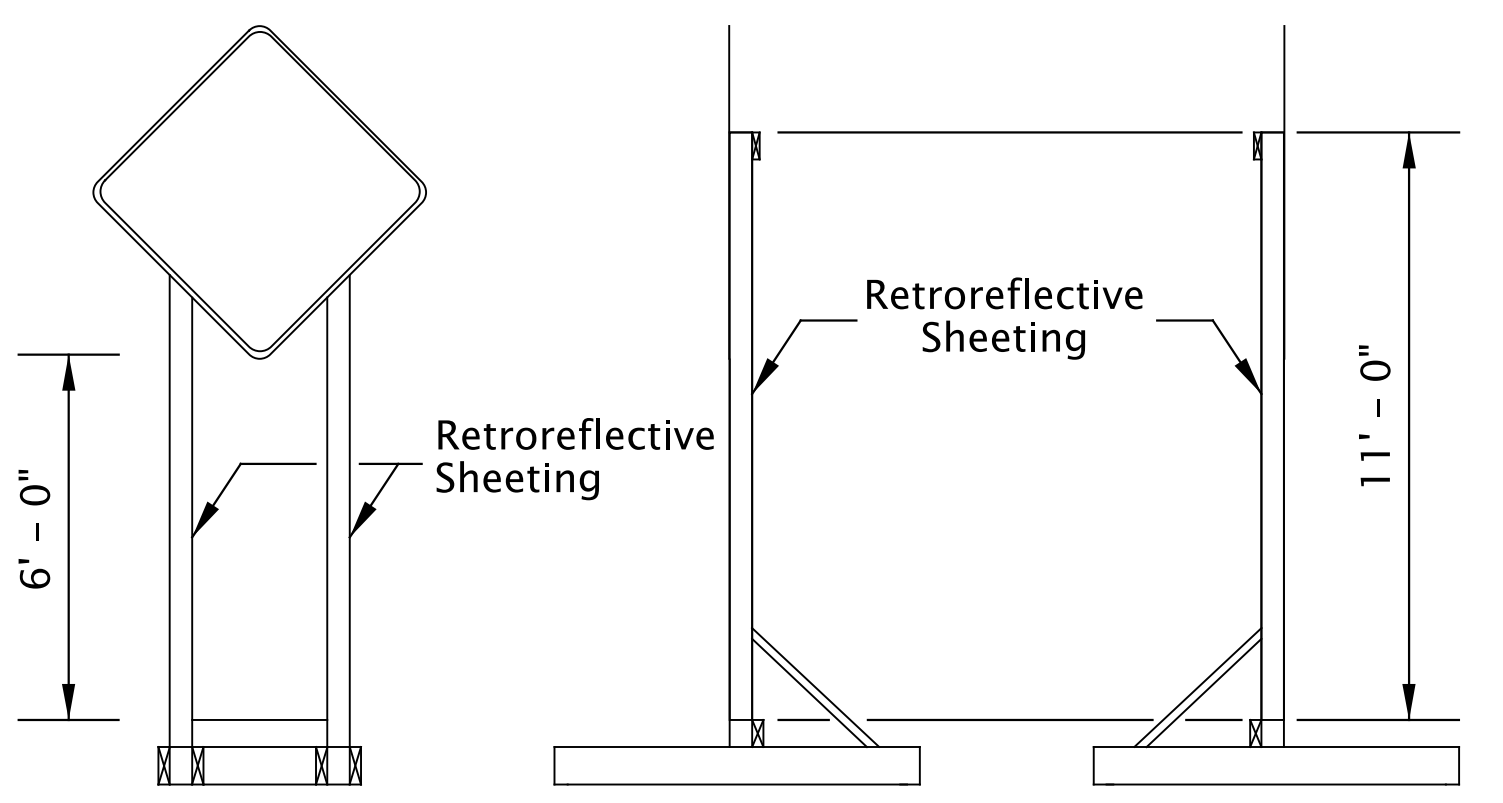
- NOTES:
- Use PSST TSS's for a total sign area of 16 sq. ft. or less.
  - All members shall have a minimum yield stress of 50 ksi.
  - Galvanize steel according to ASTM A653 with coating designation G90. Remove Galvanizing from steel before welding. Repair Galvanizing according to ASTM A780.
  - Use A325 Bolts or equivalent.
  - 2 1/4" - 12 ga. PSST to extend entire length inside of the 2 1/2" - 12 ga. x 4" PSST Stub.
  - Do not use bolt to secure 2 1/4" PSST inside of the 2 1/2" - 12 ga. x 4" PSST Stub.
  - Weld steel according to American Welding Society (AWS) D.1.1.

**PERFORATED STEEL SQUARE TUBE (PSST) DETAIL**



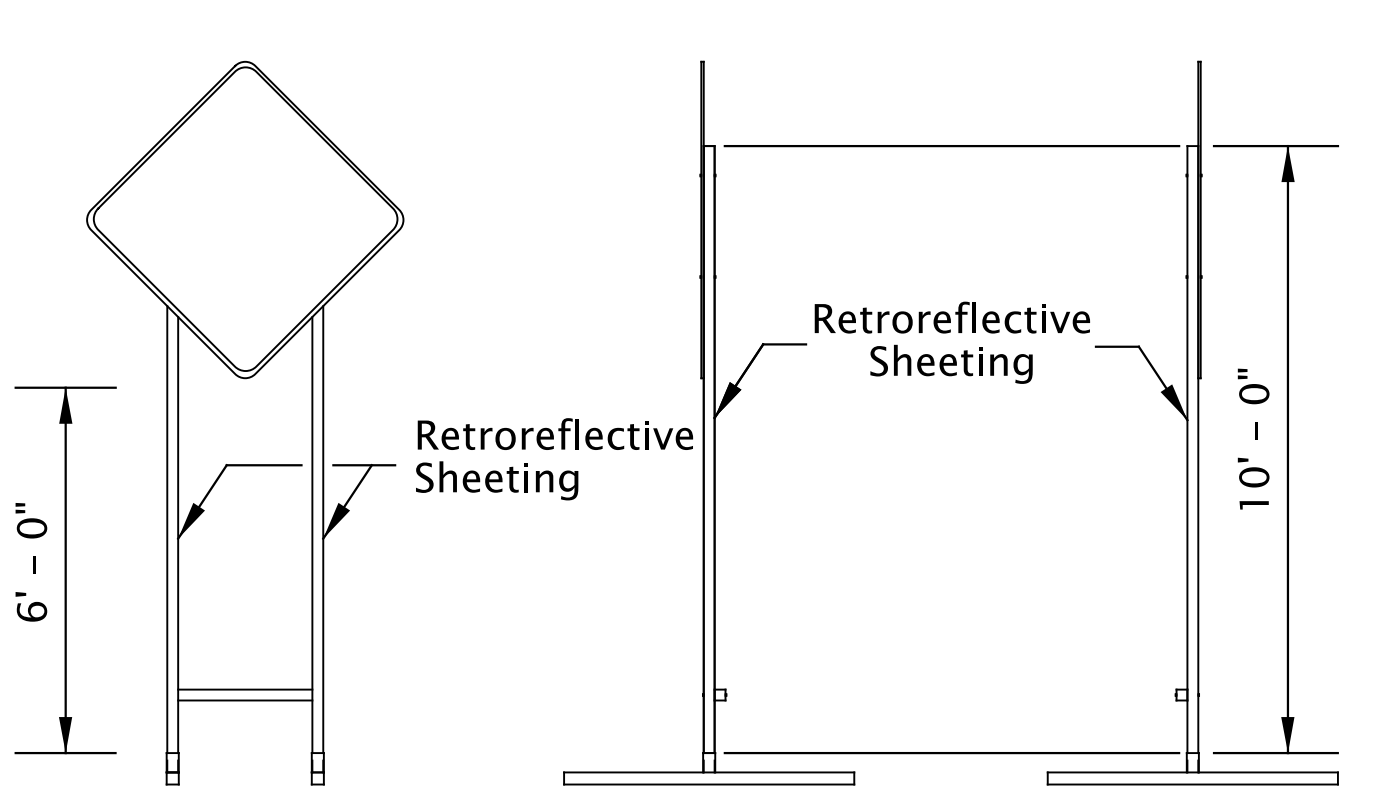
- NOTES:
- Use Single Post TSS for a total sign area of 12 sq. ft. or less.
  - Use Single Post TSS for mounting "Business Access" (CG20-11) signs. Do not mount signs on Type II or III Barricades.

**SINGLE POST DETAIL**



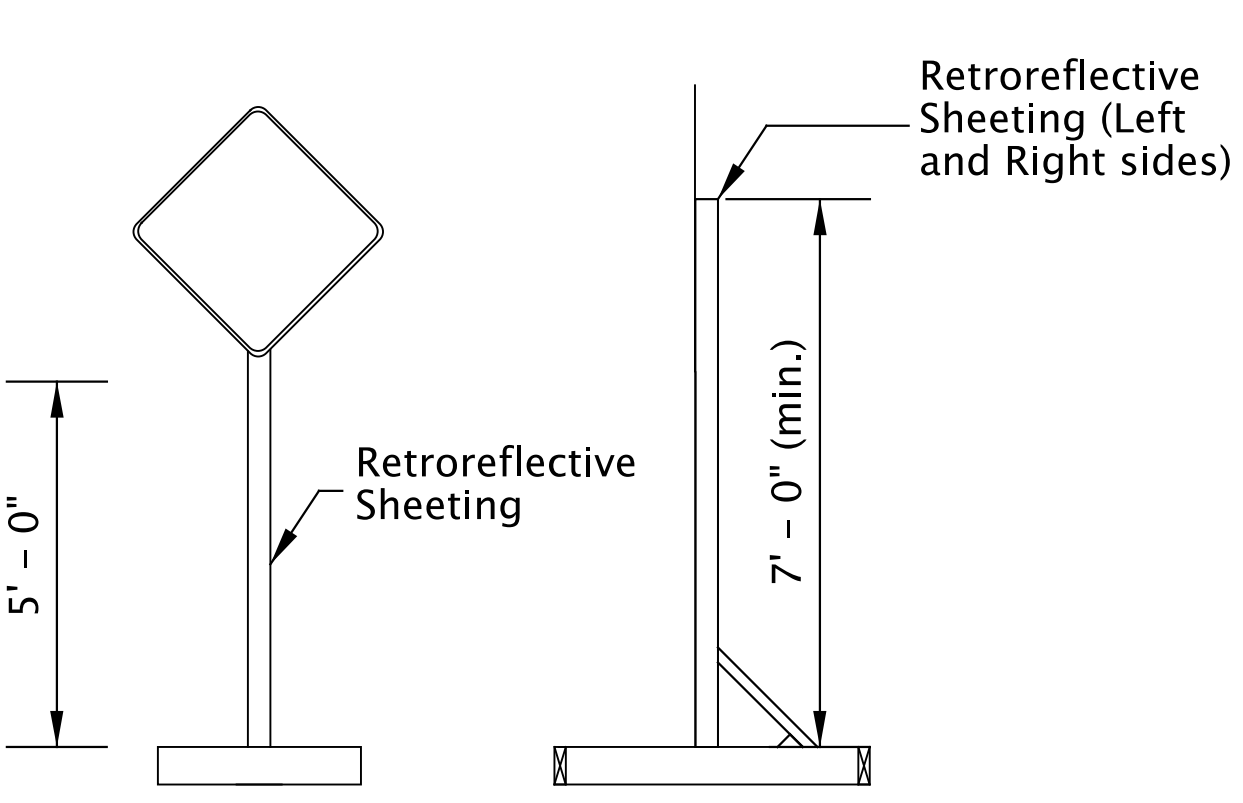
Front Right Left

**Double Post**



Front Right Left

**Perforated Steel Square Tube (PSST)**



Front Side

**Single Post**

Retroreflective Sheeting (Left and Right sides)

- TEMPORARY SIGN SUPPORT GENERAL NOTES:
- Do not tip over TSS at any time.
  - Do not locate TSS's in locations that block pedestrian or bicycle traffic.
  - For wooden TSS's, use either Douglas Fir or Hem Fir, which is surfaced four sides (S4S) and free of heart center (FOHC).
  - See "Temporary Sign Placement" detail on TM822 for sign installation heights.
  - Do not place or stack ballast more than 24" above the ground.
  - When sign is inconsistent with current work zone conditions, cover sign: or turn sign 90 degrees away from approaching traffic. Remove TSS from roadway when signing is not needed for more than 3 days.
  - Place a minimum of 50 lbs of sandbags on each of the four TSS supports legs. (25 lb. max per bag) (min. 100 lbs per side of each TSS).
  - See Dwg. No. TM204 for flag board mounting detail.

- NOTES:
- Apply fluorescent orange, ANSI Type VIII or IX retroreflective sheeting to TSS posts, as shown, for all temporary signs, except "STOP" and "DO NOT ENTER". For "STOP" and "DO NOT ENTER" signs, used red ANSI Type III or IV retroreflective sheeting on the TSS posts.
  - Apply sign post retroreflectivity to each TSS post facing front; and to the left and right sides of the TSS, as shown. Use 3" wide sheeting for wood post TSS's. Use 2" wide sheeting for PSST TSS's.
  - Sheeting may be applied directly to post material; or applied to a rigid, lightweight substrate, then securely attached to the posts.

**SIGN POST REFLECTIVE SHEETING PLACEMENT**

**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

REV	DATE	BY	DESCRIPTION
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4			
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6			
7			
8			
9			
10			
11			
12			
13			

DESIGNED	XX
DRAWN	XX
CHECKED	XX
DATE	JULY 2023



CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 CIVIL  
 OREGON STANDARD DRAWINGS  
 TRAFFIC CONTROL

VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. <b>C08</b>
0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. OF XX

Plot Date: 28-JUL-2023 8:12:19 AM

User: svcPW

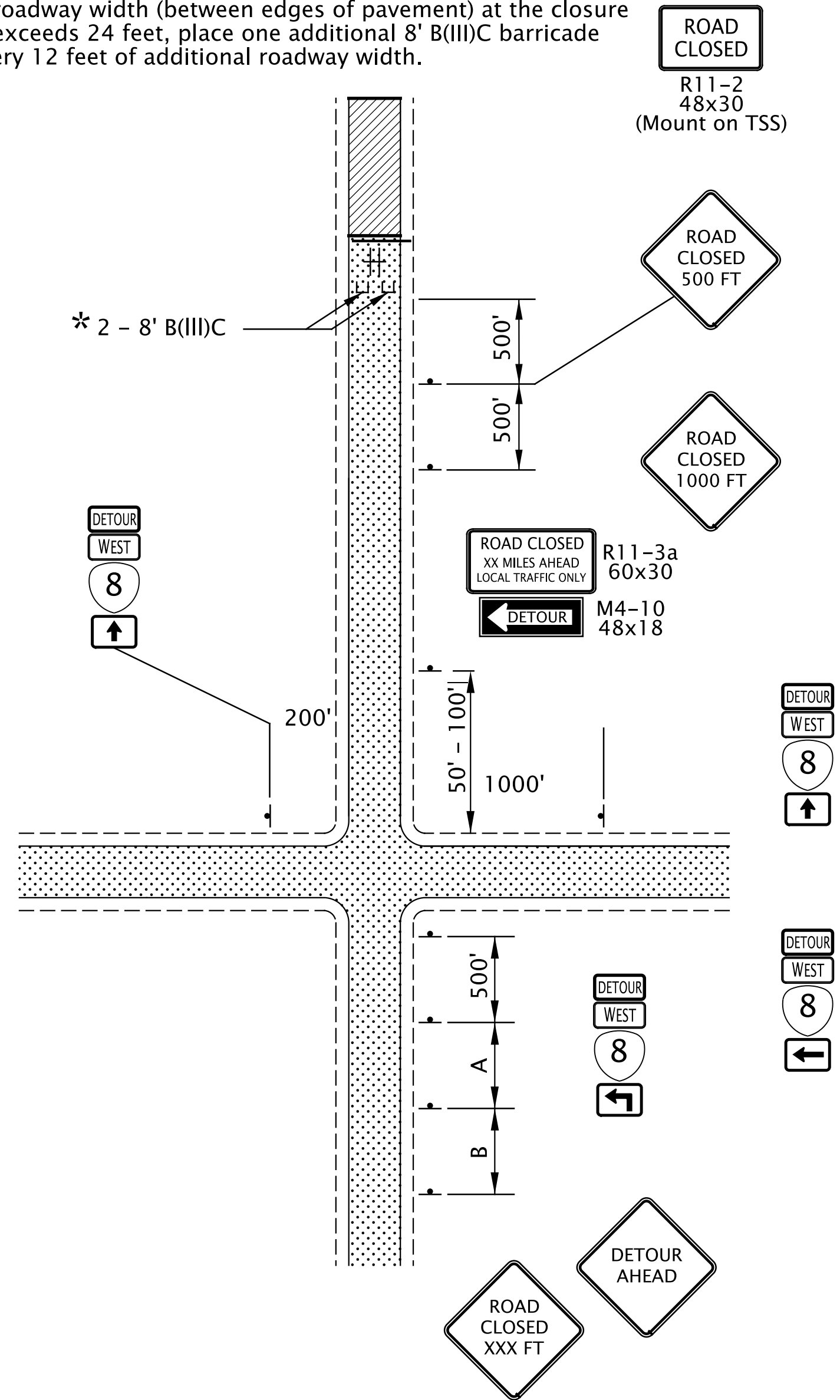
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Model: Layout1 ColorTable: gshade.cab DesignScript: Carollo\_Sig\_Pen\_v0905.pen

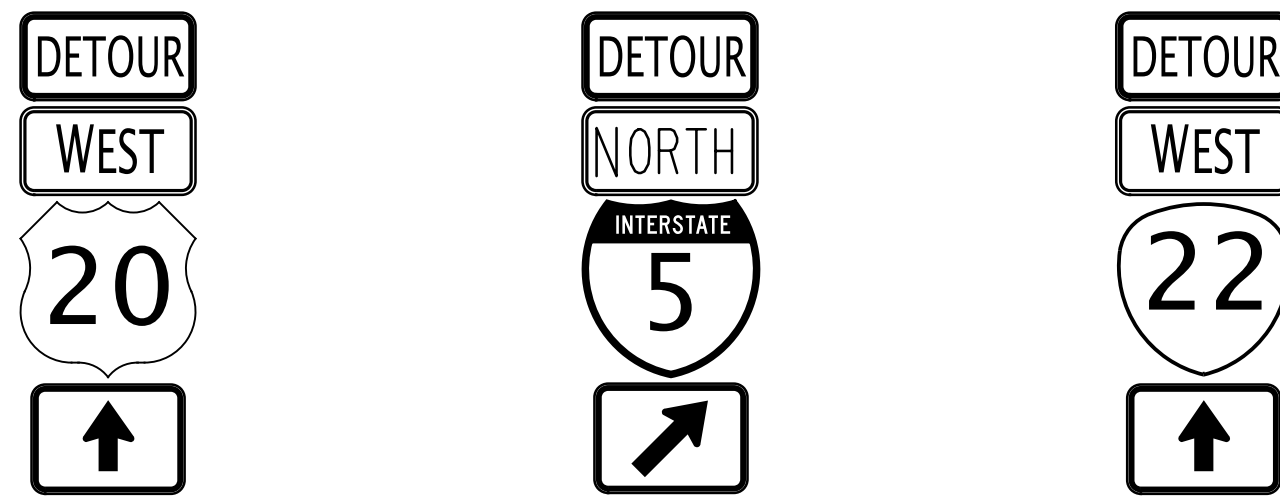
LAST SAVED BY: AEvans

NOTES:  
If closure point is less than 1500 ft. from nearest intersection, use a "ROAD CLOSED TO THRU TRAFFIC" (R11-4) sign in place of the "ROAD CLOSED XX MILES AHEAD" sign.

\* If the roadway width (between edges of pavement) at the closure point exceeds 24 feet, place one additional 8' B(III)C barricade for every 12 feet of additional roadway width.

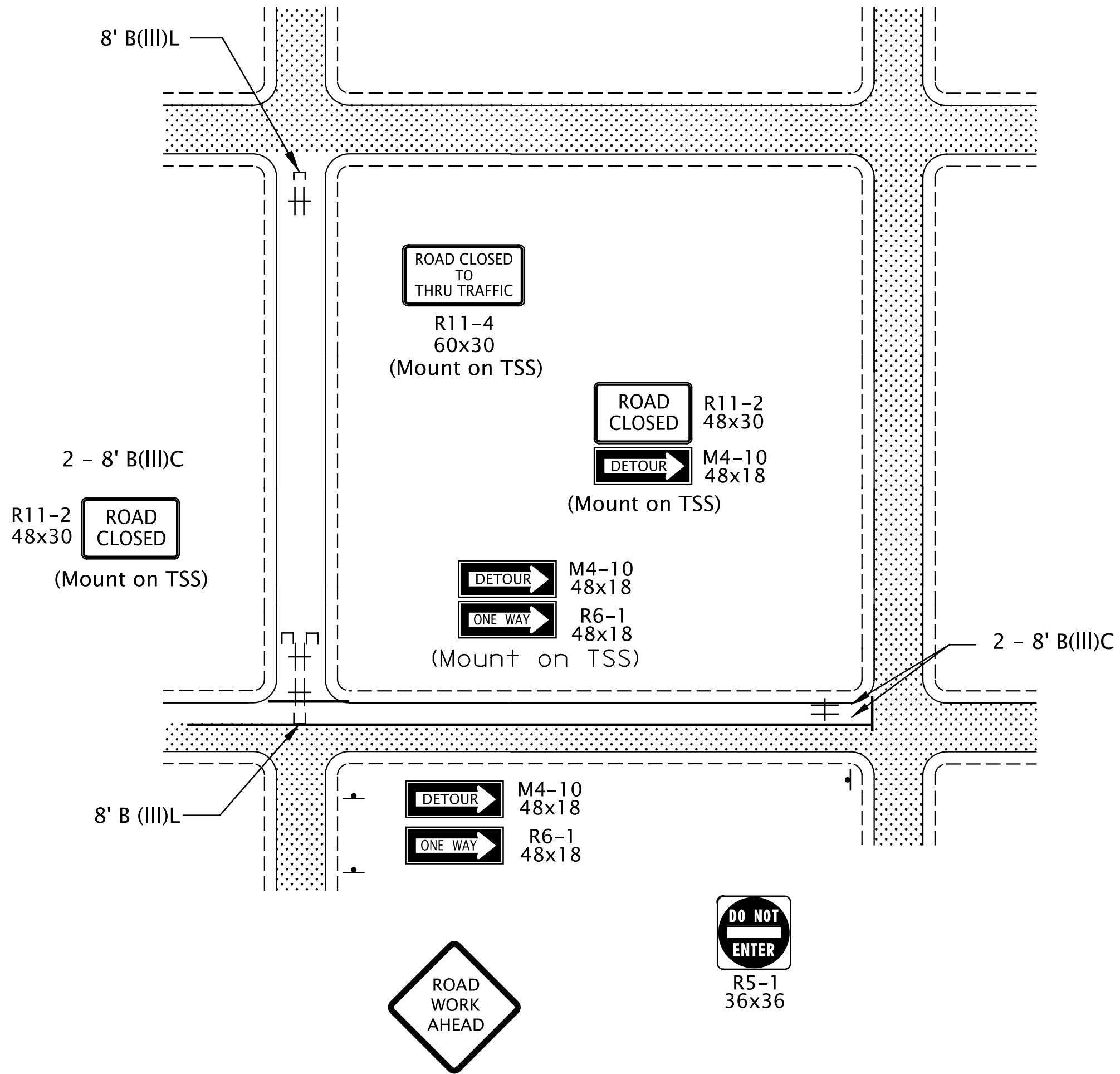


TYPICAL ROAD CLOSURE WITH DETOUR



NOTE:  
• When detour routes overlap, each Route Shield will include a separate cardinal direction, detour, and directional arrow auxiliary sign assembly.

TYPICAL TRAILBLAZER ASSEMBLY



TYPICAL PARTIAL ROAD CLOSURE

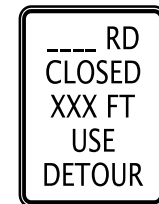
GENERAL NOTES FOR ALL DETAILS:

A "Street Name" rider may be used to enhance Road Closure signing; or provide a project specific design; or, as shown in the traffic control plan.



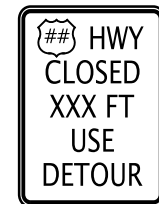
### RD  
##x18 Rider  
Rider width to be determined by width of street name.

OR



48 x 60 (nom.)  
Project Specific Design

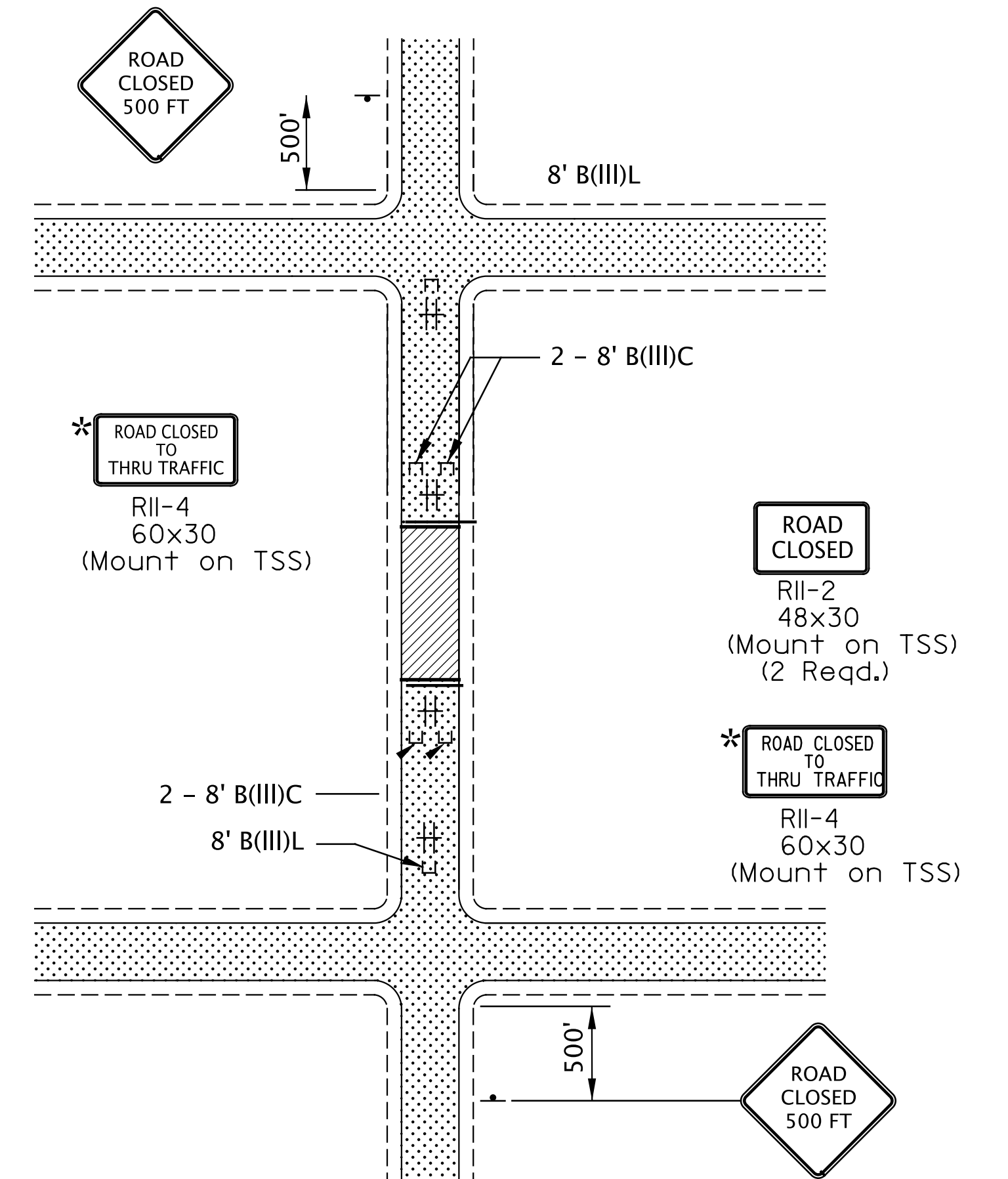
OR



48 x 60 (nom.)  
Project Specific Design

- Use a minimum of two Type III barricades for a road closure. For roads  $\geq 36'$  wide between curbs or edge of pavement, use a minimum of three Type III barricades for the closure point.
- For full road closures, the C or LR barricade may be used.
- Place additional signing as directed.
- To determine sign spacing A, B, & C, use the "TRAFFIC CONTROL DEVICES (TCD) SPACING TABLE" on Dwg. TM800.
- To be accompanied by Dwg. Nos. TM820 & TM821.

- 28" Tubular Markers  
See TCD Spacing Table on TM800 for max. spacing.
- UNDER TRAFFIC
- UNDER CONSTRUCTION



TYPICAL ROAD CLOSURE

NOTE:  
\* If accesses exist between intersection and point of closure, install "ROAD CLOSED TO THRU TRAFFIC" sign as shown.

90% DESIGN  
SUBMITTAL  
NOT FOR  
CONSTRUCTION

DESIGNED	XX
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CHECKED	XX
DATE	JULY 2023

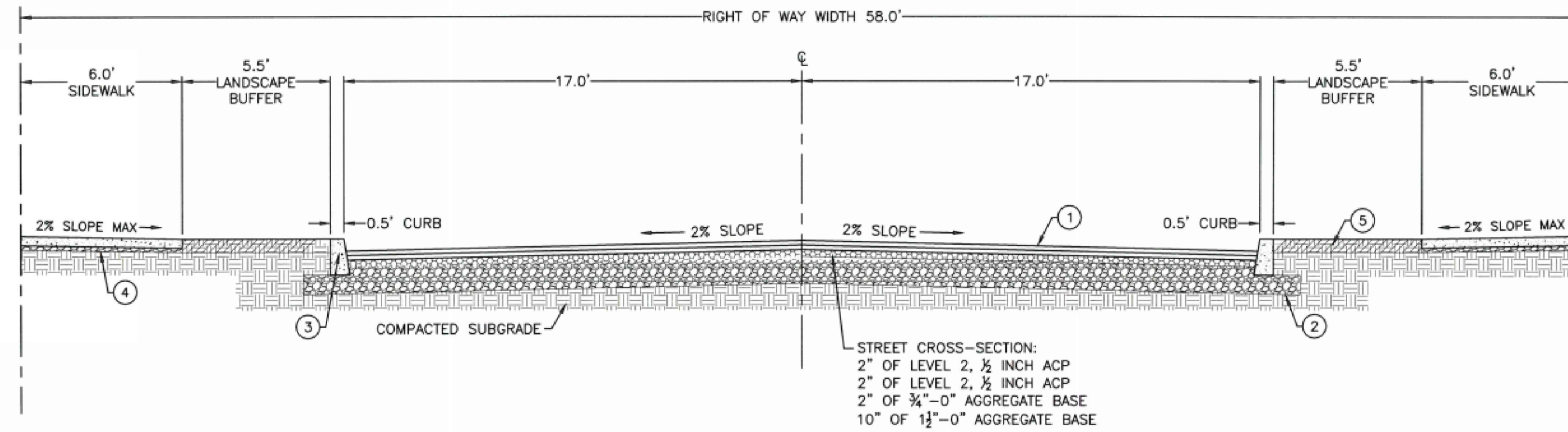


CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
CIVIL  
OREGON STANDARD DRAWINGS  
TRAFFIC CONTROL

VERIFY SCALES	JOB NO.
BAR IS ONE INCH ON ORIGINAL DRAWING	201779
0 1"	DRAWING NO.
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	C09
	SHEET NO.
	OF XX

Plot Date: 10/5/2022 11:08:46 AM

LAST SAVED BY: AE/vars



STANDARD STREET CROSS - SECTION COLLECTOR

- NOTE:
- UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER, STREETS SHALL BE PAVED TO FINAL GRADE USING 2 OR MORE LIFTS. FINAL LIFT SHALL BE PLACED ONLY AFTER ACCEPTANCE OF THE FIRST LIFT AT A TIME AS DIRECTED OR APPROVED BY THE CITY ENGINEER. A PLAIN CONCRETE PAVEMENT ALTERNATIVE CROSS-SECTION, CONSISTING OF 7 INCH PCC ON COMPACTED SUBGRADE, IS ALLOWED WITH APPROVAL OF CITY ENGINEER.
  - ROAD BASE SHALL BE PREPARED 1 FOOT BEHIND CURB.
  - STANDARD CURB PER ODOT RD700. H=16", E=4"
  - 4" OF PORTLAND CEMENT CONCRETE OVER 2" OF 3/4"-0" AGGREGATE BASE.
  - LANDSCAPE BUFFER SHALL BE COVERED WITH 6" OF QUALITY TOPSOIL.

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>				DESIGNED	MSS
				DRAWN	ARE
				CHECKED	
				DATE	JULY 2023
REV	DATE	BY	DESCRIPTION		
1					




CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 CIVIL

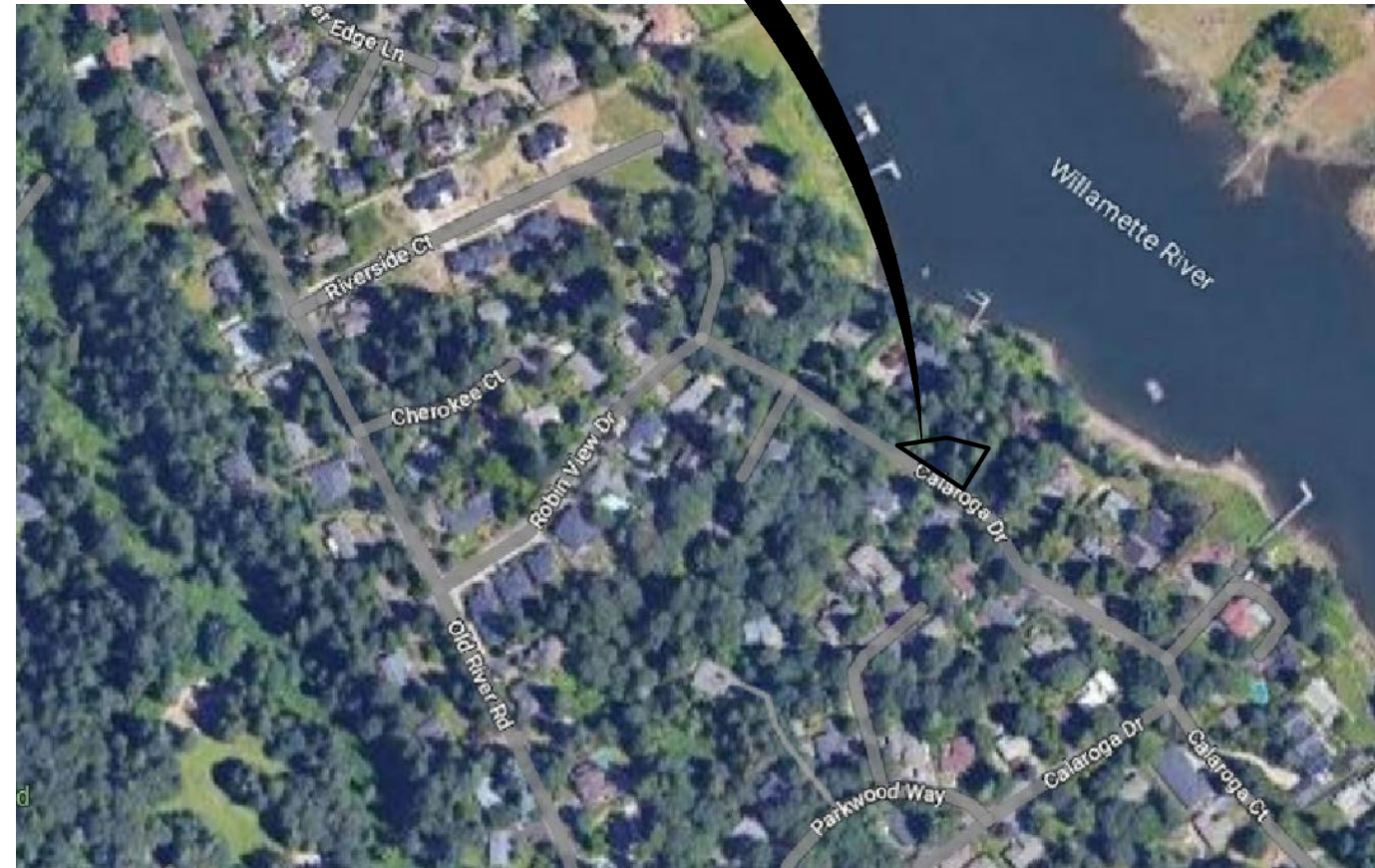
CITY OF WEST LINN  
 STANDARD DRAWINGS

VERIFY SCALES  
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 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

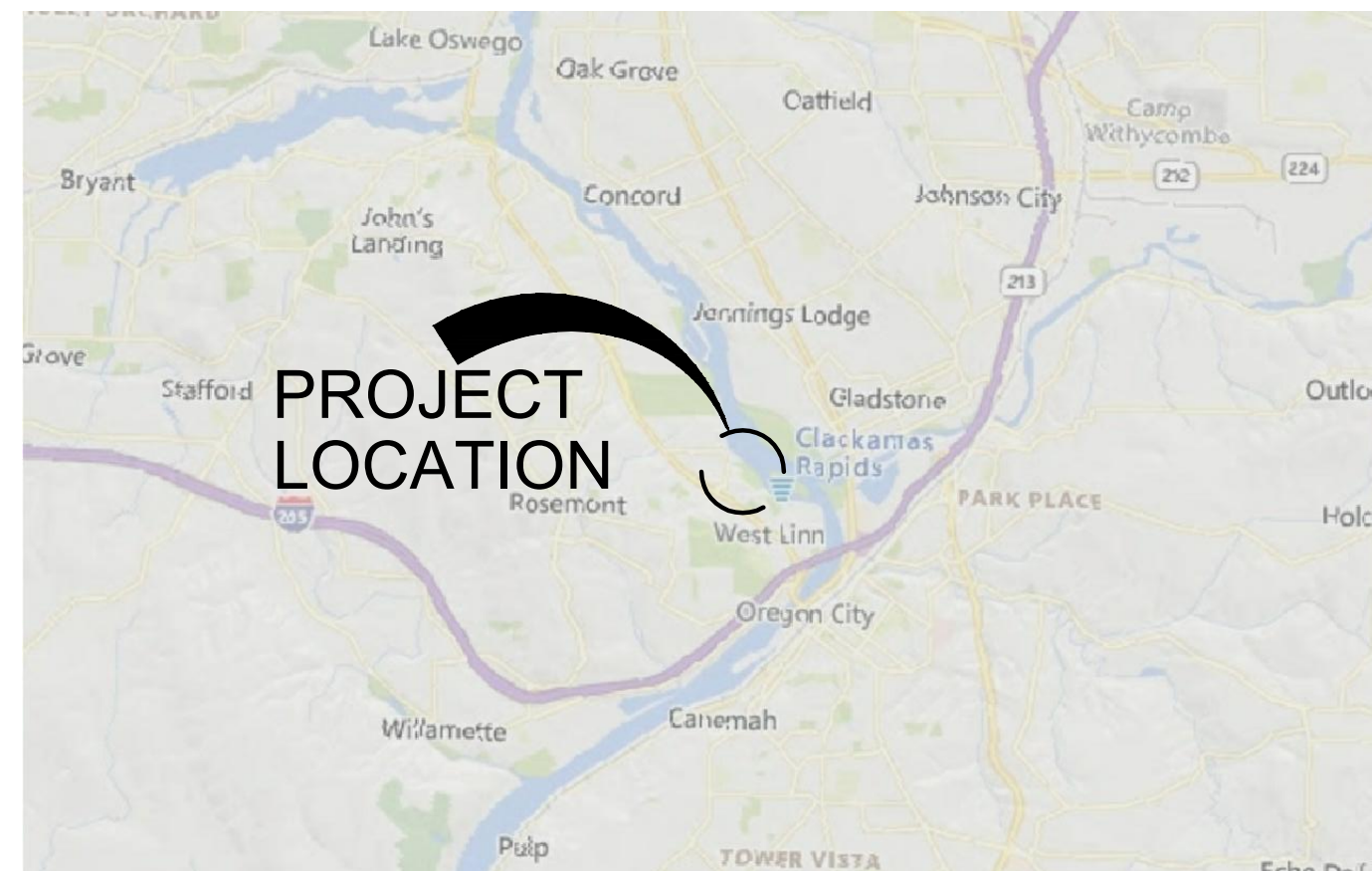
JOB NO.  
201779  
 DRAWING NO.  
**C10**  
 SHEET NO.  
X OF XX

# EROSION AND SEDIMENT CONTROL PLANS

## CALAROGA SANITARY SEWER PUMP STATION



**SITE MAP** NOT TO SCALE



**VICINITY MAP** NOT TO SCALE

**PROJECT LOCATION:**  
3821 CALAROGA DRIVE  
WEST LINN, OR 97068

**PROPERTY DESCRIPTION:**  
TAX LOT NUMBER 21E13CA01101  
PARCEL NUMBER 00296744

**ATTENTION EXCAVATORS:**

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION, CALL 503-246-6699.

**OWNER**  
CITY OF WEST LINN  
MARYNA ASUNCION  
ASSOCIATE ENGINEER  
MASUNCION@WESTLINNOREGON.GOV  
503-722-3436

**ENGINEERING FIRM**  
CAROLLO ENGINEERS  
707 SW WASHINGTON STREET  
SUITE 500  
PORTLAND, OR 97205  
(503) 227-1885  
FAX (503) 227-1747

**NARRATIVE DESCRIPTIONS**

**EXISTING SITE CONDITIONS:**  
THE PROJECT IS LOCATED ON THE PARCEL USED FOR THE CALARGOA SANITARY SEWER PUMP STATION.

**DEVELOPED CONDITIONS:**  
THE SITE CONSISTS OF THE CALAROGA SANITARY SEWER PUMP STATION NEAR TRILLIUM CREEK.

**NATURE OF CONSTRUCTION ACTIVITY:**  
CONSTRUCTION OF NEW SANITARY SEWER PUMP STATION, GRAVITY AND PRESSURIZED PIPES, AND VALVE VAULT.

**ESTIMATE OF TOTAL PERMITTED PROJECT AREA:**  
0.09 ACRES

**TOTAL DISTURBED AREA:**  
0.16 ACRES

**SITE SOIL CLASSIFICATION:**

**RECEIVING WATER BODIES:**  
WILLAMETTE RIVER VIA TRILLIUM CREEK.

**ESTIMATED TIME TABLE :**  
AUGUST 2023 TO SEPTEMBER 2024

**PERMITTEE'S SITE INSPECTOR:** \_\_\_\_\_

COMPANY/AGENCY: \_\_\_\_\_

PHONE: \_\_\_\_\_

FAX: \_\_\_\_\_

E-MAIL: \_\_\_\_\_

DESCRIPTION OF EXPERIENCE: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**INSPECTION FREQUENCY:**

SITE CONDITION	MINIMUM FREQUENCY
1. PERIODS DURING WHICH DISCHARGE IS UNLIKELY DUE TO FROZEN CONDITIONS.	MONTHLY, RESUME MONITORING IMMEDIATELY UPON MELT, OR WHEN WEATHER CONDITIONS MAKE DISCHARGES LIKELY.

## STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES:

- Hold a pre-construction meeting of project construction personnel that includes the inspector to discuss erosion and sediment control measures and construction limits. (Schedule A.8.C.I.(3))
- All inspections must be made in accordance with DEQ 1200-C permit requirements. (Schedule A.12.B and Schedule B.1)
- Inspection logs must be kept in accordance with DEQ's 1200-C permit requirements. (Schedule B.1.C and B.2)
- Retain a copy of the ESCP and all revisions on site and make it available on request to DEQ, Agent, or the local municipality. During inactive periods of greater than seven (7) consecutive calendar days, the above records must be retained by the permit registrant but do not need to be at the construction site. (Schedule B.2.C)
- All permit registrants must implement the ESCP. Failure to implement any of the control measures or practices described in the ESCP is a violation of the permit. (Schedule A.8)
- The ESCP must be accurate and reflect site conditions. (Schedule A.12.C.I)
- Submission of all ESCP revisions is not required. Submission of the ESCP revisions is only under specific conditions. Submit all necessary revision to DEQ or agent within 10 days. (Schedule A.12.C.IV. and V)
- Phase clearing and grading to the maximum extent practical to prevent exposed inactive areas from becoming a source of erosion (Schedule A.7.A.III)
- Identify, mark, and protect (by construction fencing or other means) critical riparian areas and vegetation including important trees and associated rooting zones, and vegetation areas to be preserved. Identify vegetative buffer zones between the site and sensitive areas (e.g. wetlands, and other areas to be preserved, especially in perimeter areas. (Schedule A.8.C.I.(1) and (2))
- Preserve existing vegetation when practical and re-vegetate open areas. re-vegetate open areas when practicable before and after grading or construction. Identify the type of vegetative seed mix used. (Schedule A.7.A.V)
- Maintain and delineate any existing natural buffer within the 50-feet of waters of the state. (Schedule A.7.B.I. and (2)(A)(B))
- Install perimeter sediment control, including storm drain inlet protection as well as all sediment basins, traps, and barriers prior to land disturbance. (Schedule A.8.C.I.(5))
- Control both peak flow rates and total stormwater volume, to minimize erosion at outlets and downstream channels and streambanks. (Schedule A.7.C)
- Control sediment as needed along the site perimeter and at all operational internal storm drain inlets at all times during construction, both internally and at the site boundary. (Schedule A.7.D.I)
- Establish concrete truck and other concrete equipment washout areas before beginning concrete work. (Schedule A.8.C.I.(6))
- Apply temporary and/or permanent soil stabilization measure immediately on all disturbed areas as grading progresses. temporary or permanent stabilizations measures are not required for area that are intended to be left unvegetated, such as dirt access roads or utility pole pads. (Schedule A.8.C.II.(3))
- Establish material and waste storage areas, and other non-stormwater controls. (Schedule A.8.C.I.(7))
- Prevent tracking of sediment onto public or private roads using BMPs such as: Construction Entrance, Graveled (or Paved) exits and parking areas, gravel all unpaved roads located onsite, or use an exist tire wash. These BMPs must be in place prior to land disturbing activities. (Schedule A.7.D.II and A.8.C.I.(4))
- When trucking saturated soils from the site, either use water-tight trucks or drain loads on site. (Schedule A.7.D.II.(5))
- Control prohibited discharges from leaving the construction site, i.e. concrete wash-out, wastewater from cleanout of stucco, paint and curing compounds. (Schedule (A.6)
- Use BMPs to prevent or minimize stormwater exposure to pollutants from spills; vehicle and equipment fueling, maintenance, and storage; other cleaning and maintenance activities; and waste handling activities. These pollutants include fuel, hydraulic fluid, and other oils from vehicles and machinery, as well as debris, fertilizer, pesticides and herbicides, paints, solvents, curing compounds and adhesives from construction operations. (Schedule A.7.E.I.(2))
- Implement the following BMPs when applicable: Written spill prevention and response procedures, employee training on spill prevention and proper disposal procedures, spill kits in all vehicles, regular maintenance schedule for vehicles and machinery, material delivery and storage controls, training and signage, and covered storage areas for waste and supplies. (Schedule A.7.E.III.)
- Use water, soil-binding agent or other dust control technique as needed to avoid wind-blown soil. (Schedule A.7.A.IV)
- The application rate of fertilizers used to reestablish vegetation must follow manufacturer's recommendations to minimize nutrient releases to surface waters. Exercise caution when using time-release fertilizers within any waterway riparian zone. (Schedule A.9.B.III)
- If an active treatment system (for example, electro-coagulation, flocculation, filtration, etc.) for sediment or other pollutant removal is employed, submit an operation and maintenance plan (including system schematic, location of system, location of inlet, location of discharge, discharge dispersion device design, and a sampling plan and frequency) before operating the treatment system. Obtain plan approval before operating the treatment system. Operate and maintain the treatment system according to manufacturer's specifications. (Schedule A.9.D)
- Temporarily stabilize soils at the end of the shift before holidays and weekends, if needed. The registrant is responsible for ensuring that soils are stable during rain events at all times of the year. (Schedule A.7.B)
- As needed based on weather conditions, at the end of each workday soil stockpiles must be stabilized or covered, or other BMPs must be implemented to prevent discharges to surface waters or conveyance systems leading to surface waters. (Schedule A.7.E.II.(2))
- Construction activities must avoid or minimize excavation and bare ground activities during wet weather. (Schedule A.7.A.I)
- Sediment fence: remove trapped sediment before it reaches one third of the above ground fence height and before fence removal. (Schedule A.9.C.I)
- Other sediment barriers (such as biobags): remove sediment before it reaches two inches depth above ground height and before BMP remove. (Schedule A.9.C.I)
- Catch basins: clean before retention capacity has been reduced by fifty percent. Sediment basins and sediment traps: remove trapped sediments before design capacity has been reduced by fifty percent and at completion of project. (Schedule A.9.C.III & IV)
- Within 24 hours, significant sediment that has left the construction site, must be remediated. Investigate the cause of the sediment release and implement steps to prevent a recurrence of the discharge within the same 24 hours. Any in-stream clean-up or sediment shall be performed according to the Oregon Division of State Lands required time frame. (Schedule A.9.B.I)
- The intentional washing of sediment into storm sewers or drainage ways must not occur. vacuuming or dry sweeping and material pickup must be used to cleanup released sediments. (Schedule A.9.B.II)
- The entire site must be temporarily stabilized using vegetation or a heavy mulch layer, temporary seeding, or other method should all construction activities cease for 30 days or more. (Schedule A.7.F.I)
- Provide temporary stabilization for that portion of the site where construction activities cease for 14 days or more with a covering of blown straw and a tackifier, loose straw, or an adequate covering of compost mulch until work resumes on that portion of the site. (Schedule A.7.F.II)
- Do not remove temporary sediment control practices until permanent vegetation or other cover of exposed areas is established. Once construction is complete and the site is stabilized, all temporary erosion controls and retained soils must be removed and disposed of properly, unless doing so conflicts with local requirements. (Schedule A.8.C.III(1) and D.3.C.II and III)

- \* Hold a pre-construction meeting of project construction personnel that includes the inspector to discuss erosion and sediment control measures and construction limits.
- \* All inspections must be made in accordance with DEQ's 1200-c permit requirements.
- \* Inspection logs must be kept in accordance with DEQ's 1200-c permit requirements.
- \* Retain a copy of the ESCP and all revisions on site and make it available on request to DEQ, agent, or the local municipality, during inactive periods of greater than seven (7) consecutive calendar days, retain the ESCP at the construction site or at another location.

THE PERMITTEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200-C PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200-C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200-C PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THE PLAN.

## BMP MATRIX FOR CONSTRUCTION

REFER TO DEQ GUIDANCE MANUAL FOR A COMPREHENSIVE LIST OF AVAILABLE BMP'S.

	CLEARING	MASS GRADING	UTILITY INSTALLATION	PAVING CONSTRUCTION	FINAL STABILIZATION	WET WEATHER (OCT. 1-MAY 31ST)
<b>EROSION PREVENTION</b>						
PRESERVE NATURAL VEGETATION	X	X	X	X	X	X
GROUND COVER		X		X	X	X
PLASTIC SHEETING	X	X	X	X	X	X
STRAW MULCH COVER		X	X	X	X	X
DUST CONTROL	X	X	X	X	X	X
TEMPORARY/PERMANENT SEEDING		X		X	X	X
BUFFER ZONE	X	X	X	X	X	X
<b>SEDIMENT CONTROL</b>						
SEDIMENT FENCE (INTERIOR)	**X	X	X	X	X	X
INLET PROTECTION	**X	X	X	X	X	X
DEWATERING		X				
<b>RUN OFF CONTROL</b>						
CONSTRUCTION ENTRANCE	**X	X	X	X		X
<b>POLLUTION PREVENTION</b>						
PROPER SIGNAGE	X	X	X	X	X	X
HAZ WASTE MGMT	X	X	X	X	X	X
SPILL KIT ON-SITE	X	X	X	X	X	X
CONCRETE WASHOUT AREA			X	X	X	X

\* SIGNIFIES ADDITIONAL BMP'S REQUIRED FOR WORK WITHIN 50' OF WATER OF THE STATE.

\*\* SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY.

## NDPES 1200C INSPECTION FREQUENCY TABLE

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING RUNOFF FROM SNOW MELT, IS OCCURRING.
2. PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY.	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURE ARE IN WORKING ORDER. ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE.
3. INACTIVE PERIODS GREATER THAN FOURTEEN (14) CONSECUTIVE CALENDAR DAYS.	ONCE EVERY MONTH.
4. PERIODS DURING WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER.	IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION.
5. PERIODS DURING WHICH DISCHARGE IS UNLIKELY DUE TO FROZEN CONDITIONS.	MONTHLY. RESUME MONITORING IMMEDIATELY UPON MELT, OR WHEN WEATHER CONDITIONS MAKE DISCHARGES LIKELY.

## RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ'S GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMP'S WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THE PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS, AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

MSS INITIAL

## SHEET INDEX

### EROSION AND SEDIMENT CONTROL PLANS

- ESC-01 EROSION AND SEDIMENT CONTROL COVER SHEET
- ESC-02 EROSION AND SEDIMENT CONTROL SITE PLAN
- ESC-03 EROSION AND SEDIMENT CONTROL DETAILS

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED	J EY		
DRAWN	SCR		
CHECKED			
DATE	JULY 2023		
REV	DATE	BY	DESCRIPTION
1			
2			
3			

DESIGNED	J EY
DRAWN	SCR
CHECKED	
DATE	JULY 2023

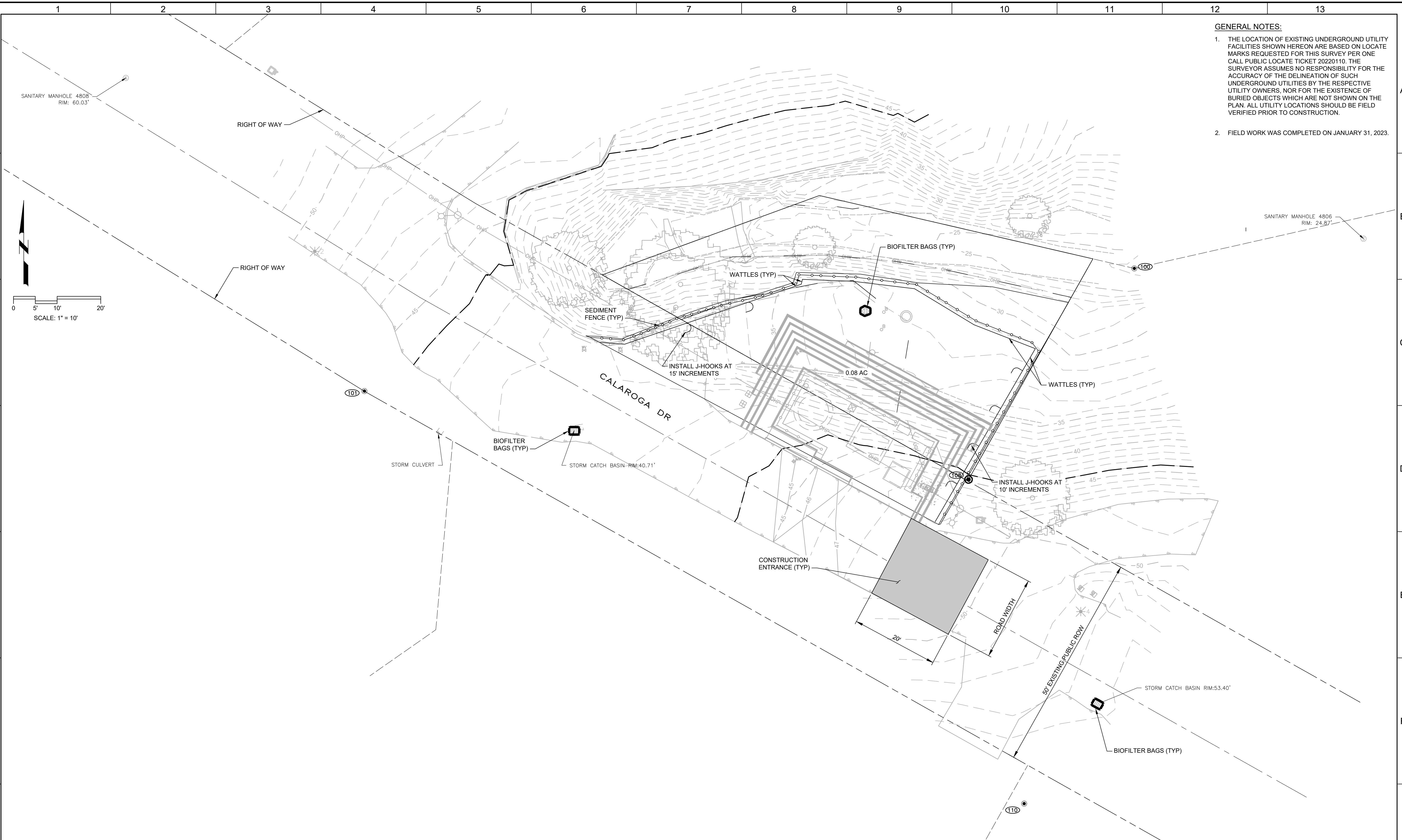


CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT  
CIVIL  
**EROSION AND SEDIMENT CONTROL COVER SHEET**

VERIFY SCALES  
JOB NO. 201779  
DRAWING NO. ESC01  
SHEET NO. 21 OF XX

Plot Date: 10/5/2022 11:08:46 AM

- GENERAL NOTES:**
1. THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS SURVEY PER ONE CALL PUBLIC LOCATE TICKET 20220110. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS, NOR FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  2. FIELD WORK WAS COMPLETED ON JANUARY 31, 2023.



LAST SAVED BY: AE/vars

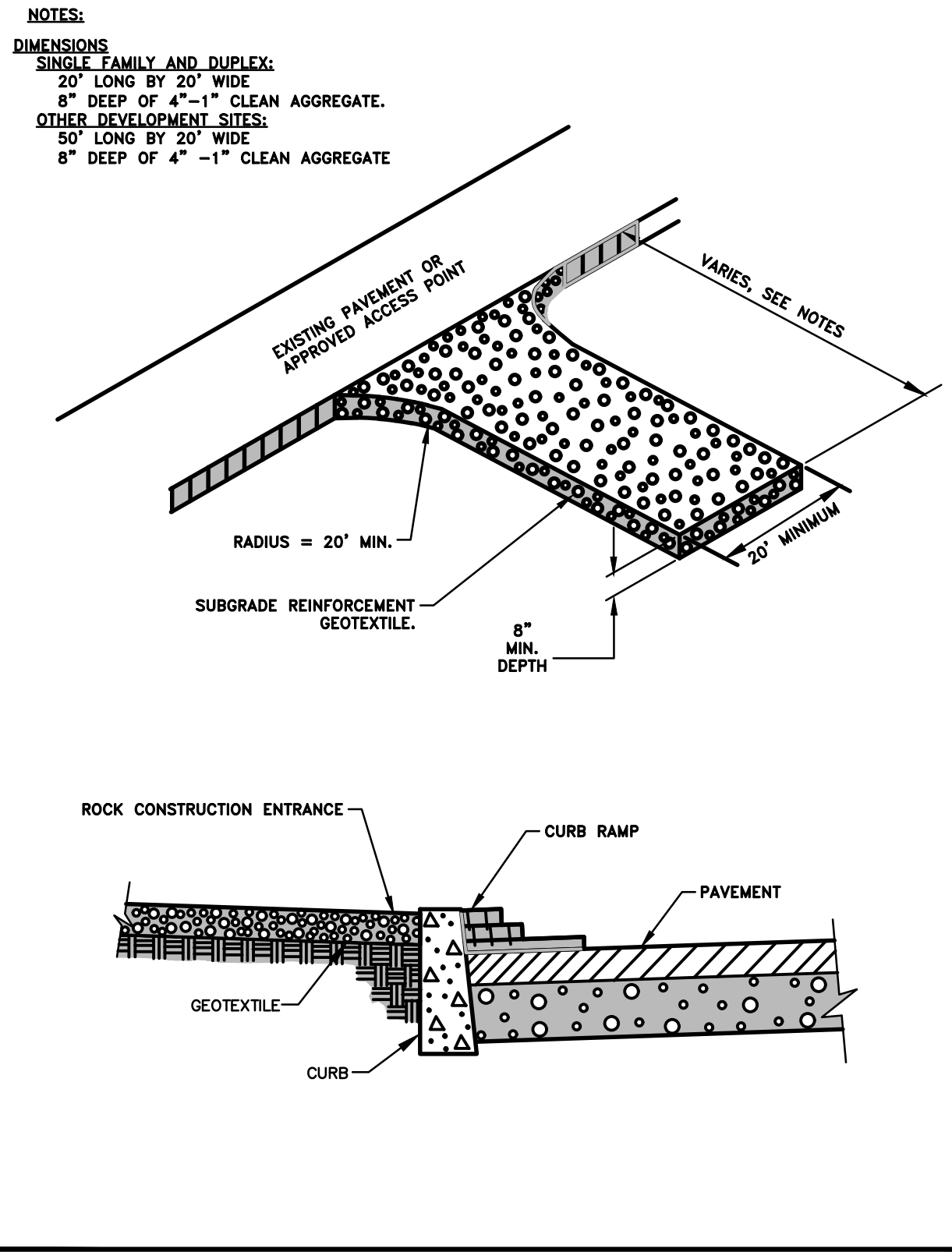
<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
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DATE JULY 2023	

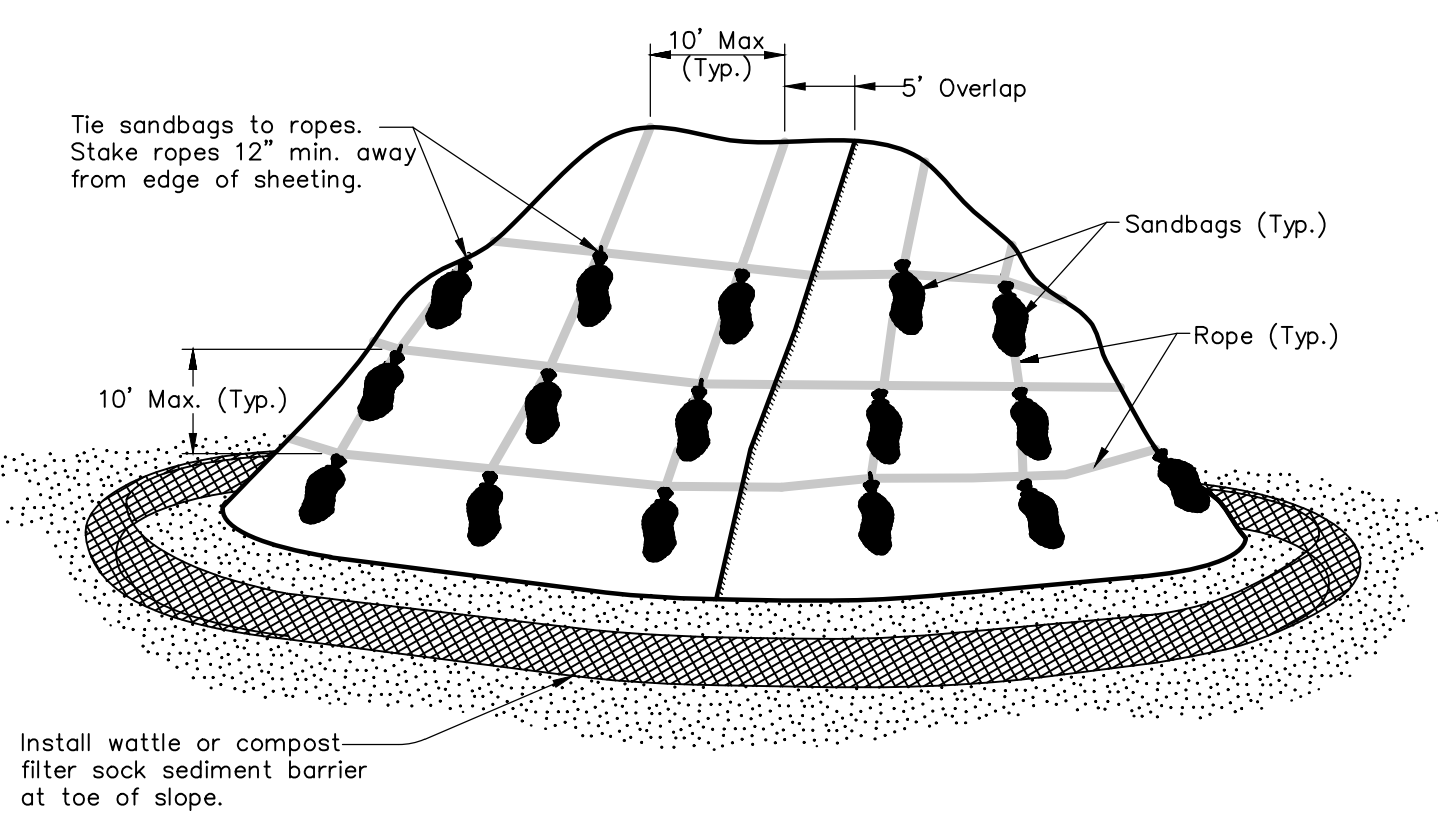
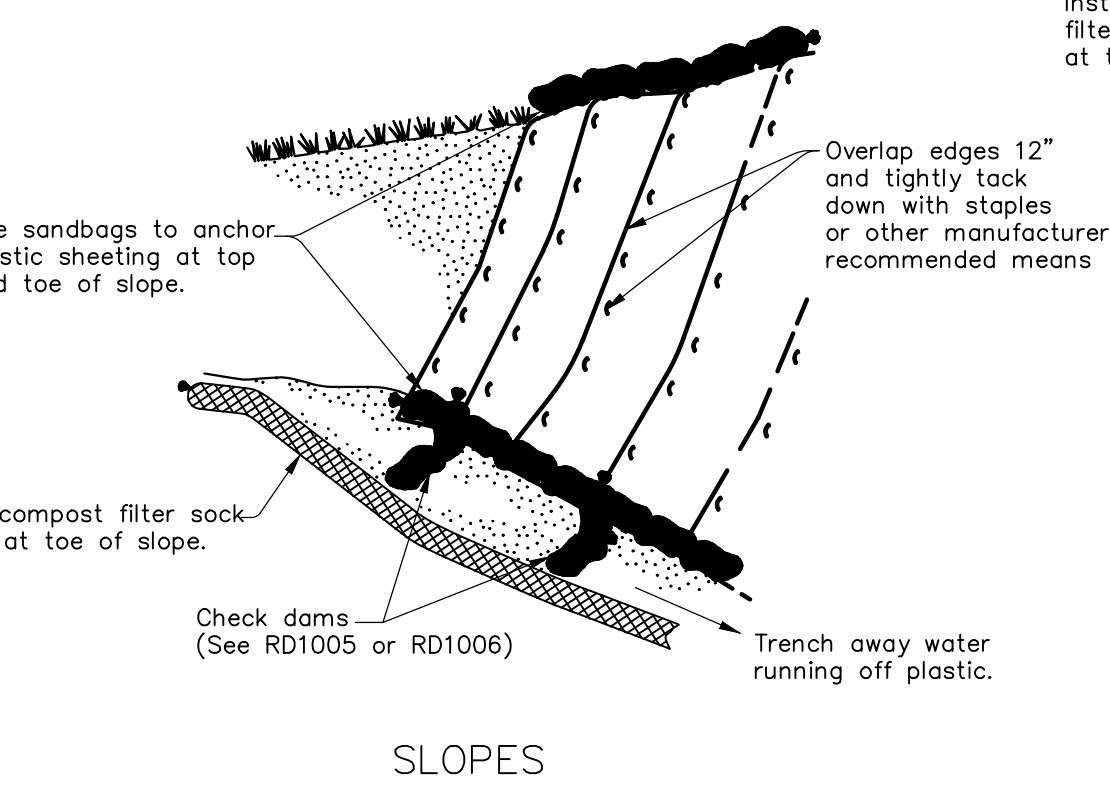
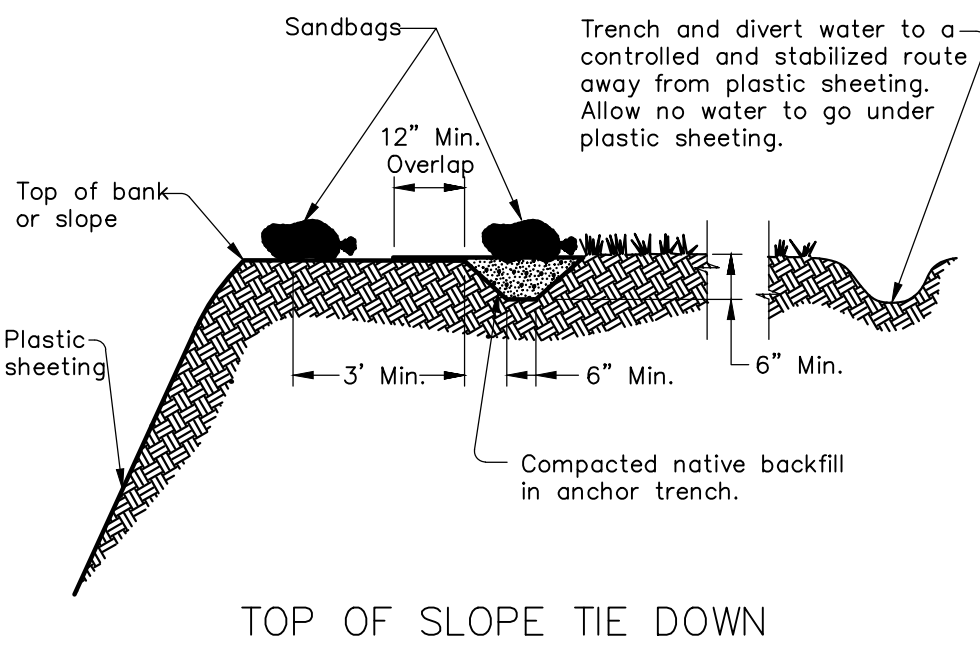


CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 CIVIL  
**EROSION AND SEDIMENT CONTROL SITE PLAN**

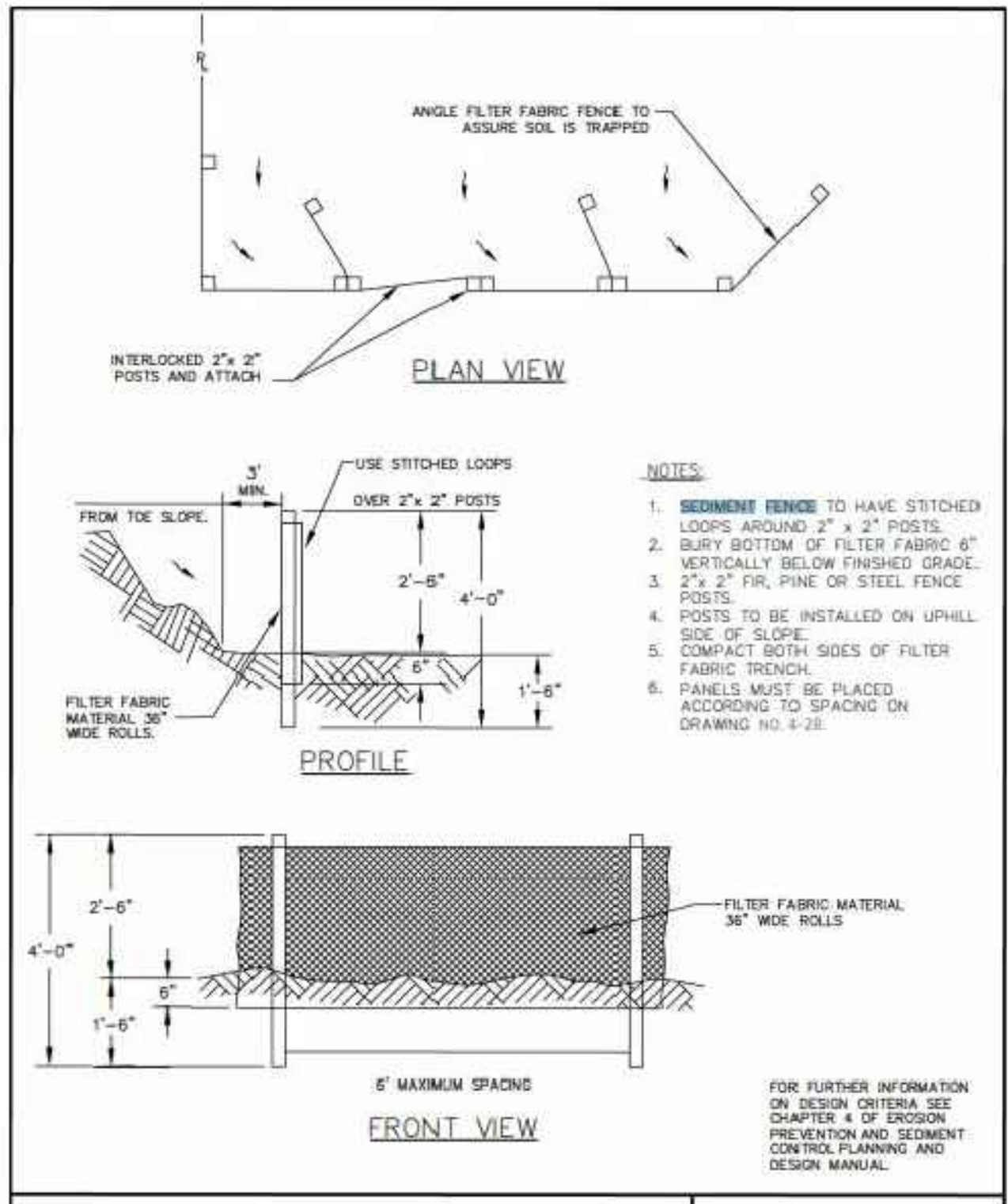
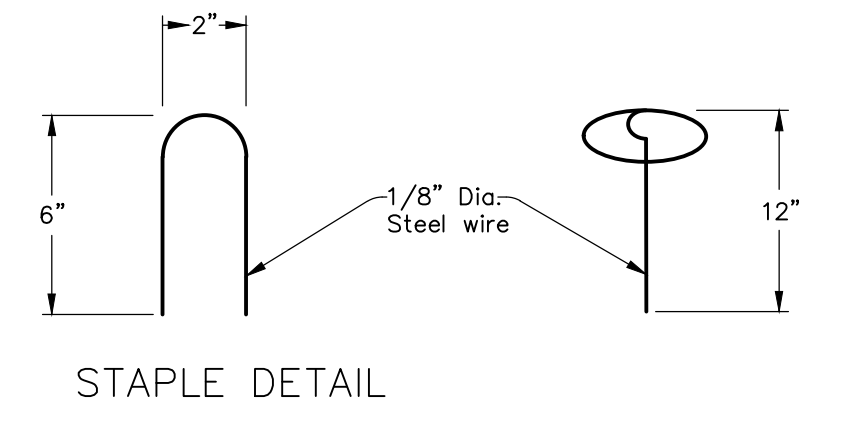
VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201779 DRAWING NO. <b>ESC02</b> SHEET NO. X OF XX
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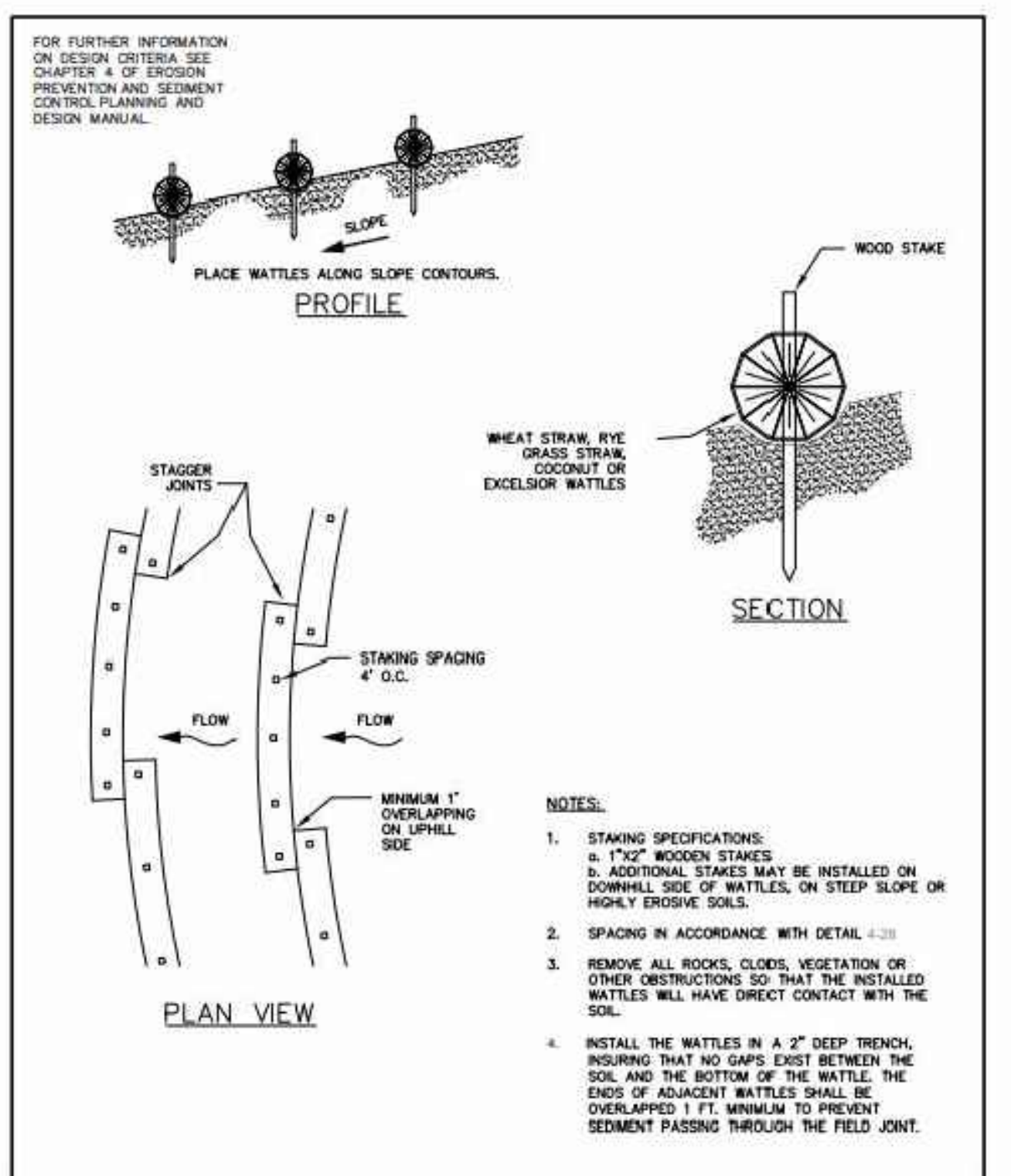
City of Lake Oswego Engineering Division Erica Rooney, P.E., City Engineer	CONSTRUCTION ENTRANCE	E1-06
EFFECTIVE DATE: JANUARY 1, 2018	NOT TO SCALE	DRAWING NUMBER



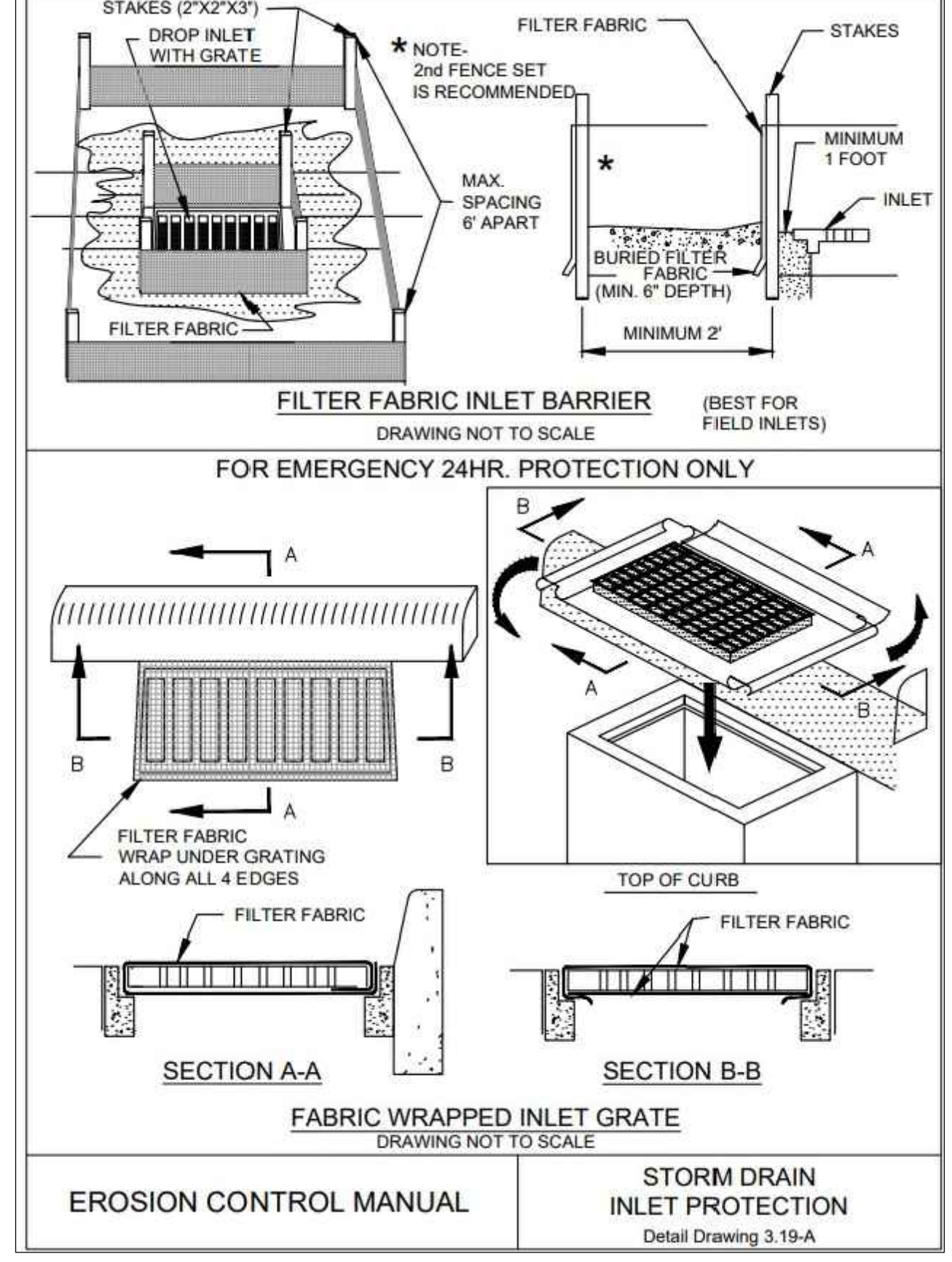
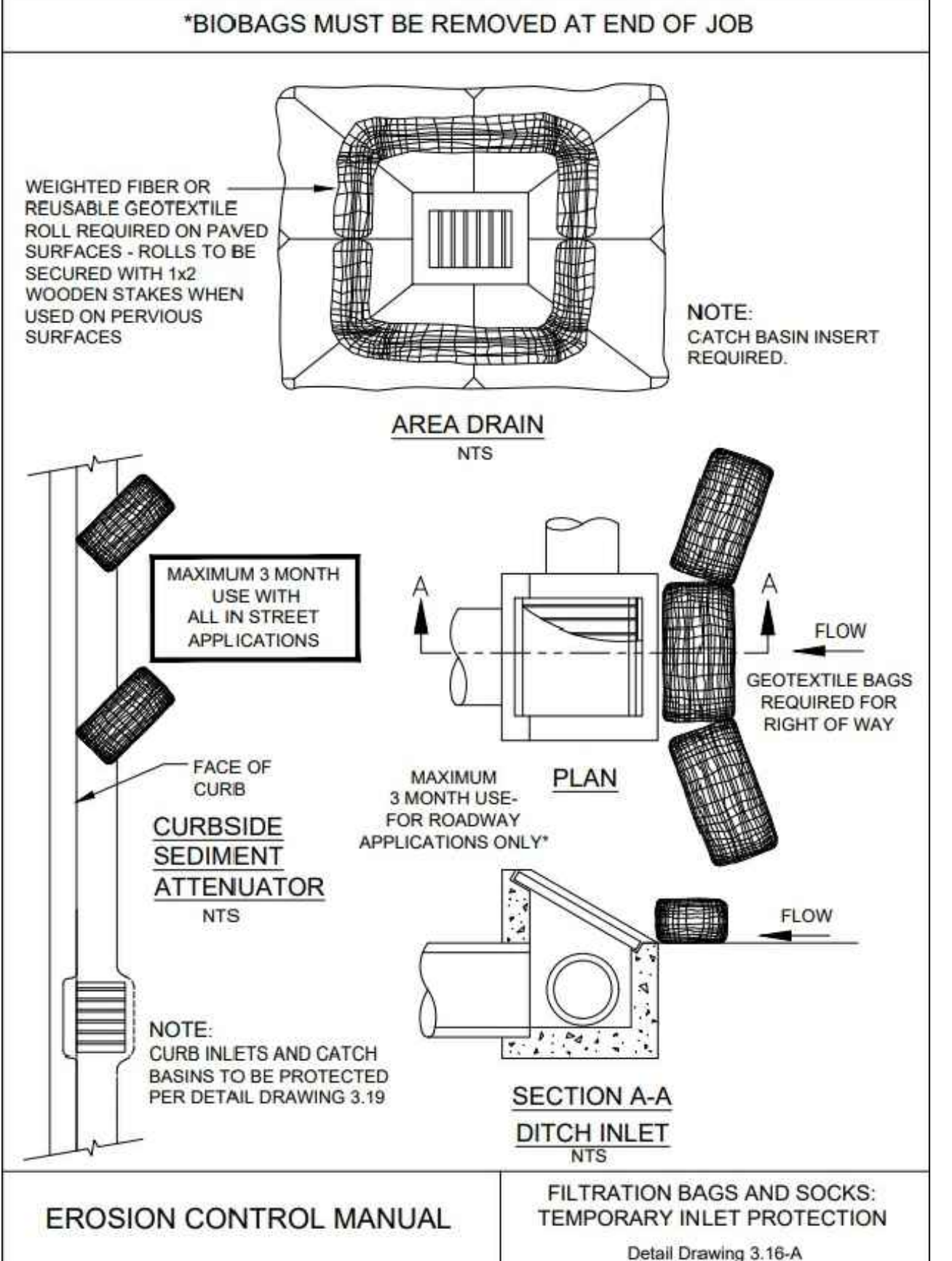
- NOTES:**
1. Install plastic sheeting vertically down slope.
  2. Install plastic sheeting so edges overlap and are shingled away from prevailing winds.



- NOTES:**
1. SEDIMENT FENCE TO HAVE STITCHED LOOPS AROUND 2" x 2" POSTS.
  2. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
  3. 2" x 2" FIR, PINE OR STEEL FENCE POSTS.
  4. POSTS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
  5. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
  6. PANELS MUST BE PLACED ACCORDING TO SPACING ON DRAWING NO. 4-2E.



- NOTES:**
1. STAKING SPECIFICATIONS: a. 1" x 2" WOODEN STAKES b. ADDITIONAL STAKES MAY BE INSTALLED ON DOWNHILL SIDE OF WATTLES, ON STEEP SLOPE OR HIGHLY ERODIBLE SOILS.
  2. SPACING IN ACCORDANCE WITH DETAIL 4-16.
  3. REMOVE ALL ROCKS, CLODS, VEGETATION OR OTHER OBSTRUCTIONS SO THAT THE INSTALLED WATTLES WILL HAVE DIRECT CONTACT WITH THE SOIL.
  4. INSTALL THE WATTLES IN A 2" DEEP TRENCH, INSURING THAT NO GAPS EXIST BETWEEN THE SOIL AND THE BOTTOM OF THE WATTLE. THE ENDS OF ADJACENT WATTLES SHALL BE OVERLAPPED 1 FT. MINIMUM TO PREVENT SEDIMENT PASSING THROUGH THE FIELD JOINT.



90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION

DESIGNED JEY	DATE JULY 2023
DRAWN SCR	
CHECKED	

REV	DATE	BY	DESCRIPTION
1			
2			
3			

**carollo**

CITY OF West Linn

CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 CIVIL

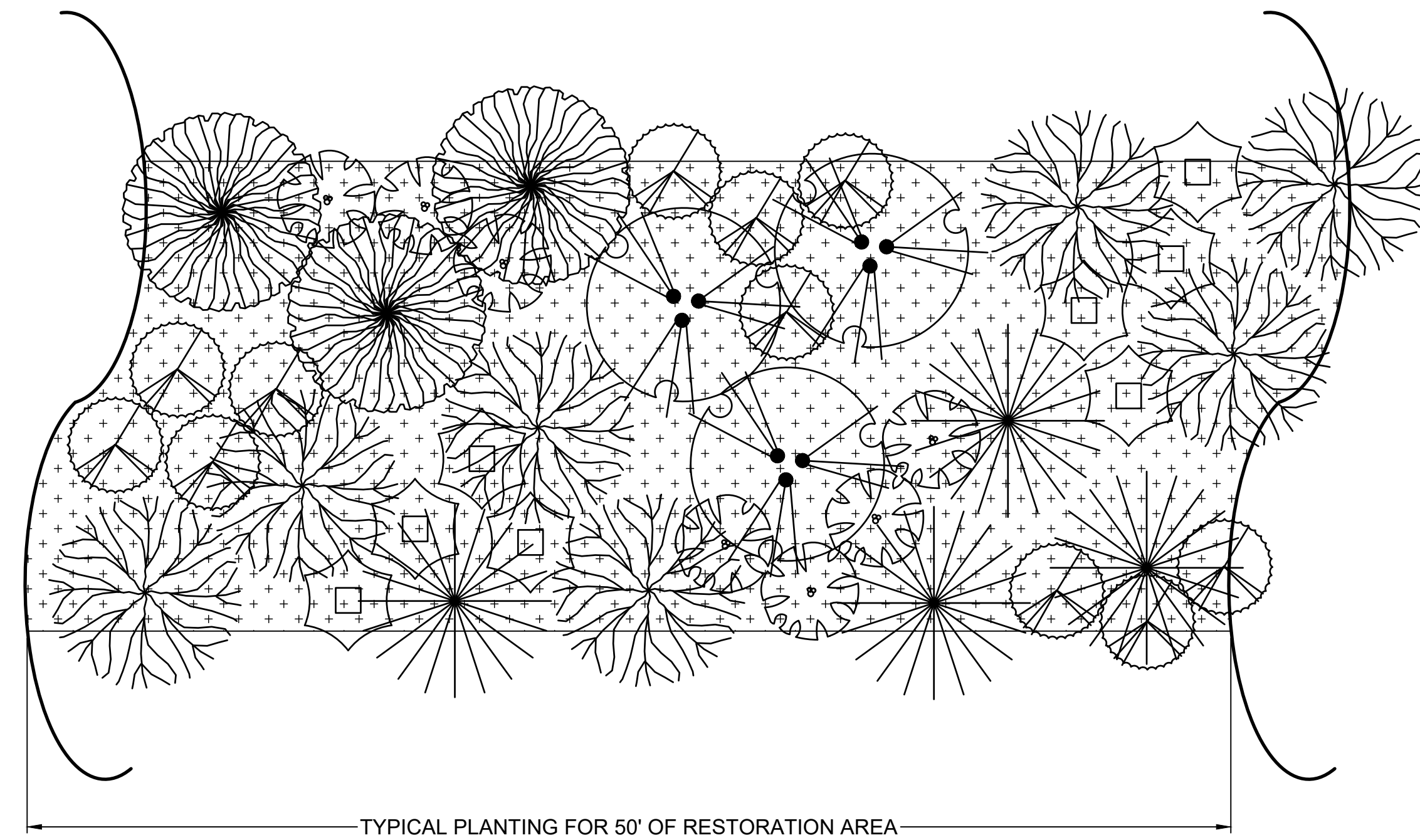
EROSION AND SEDIMENT CONTROL DETAILS

VERIFY SCALES  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 0 1"  
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
 DRAWING NO. ESC03  
 SHEET NO. 21 OF XX



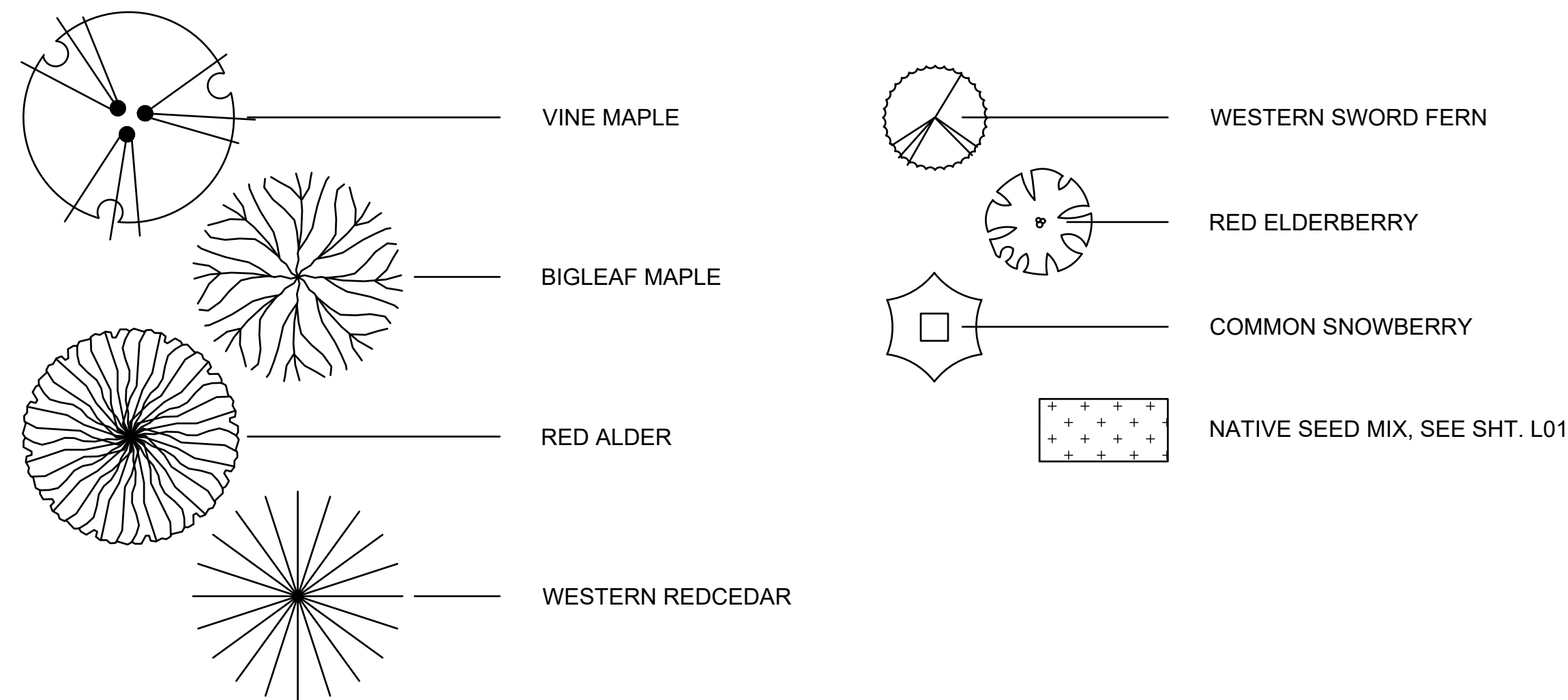




**NOTES:**

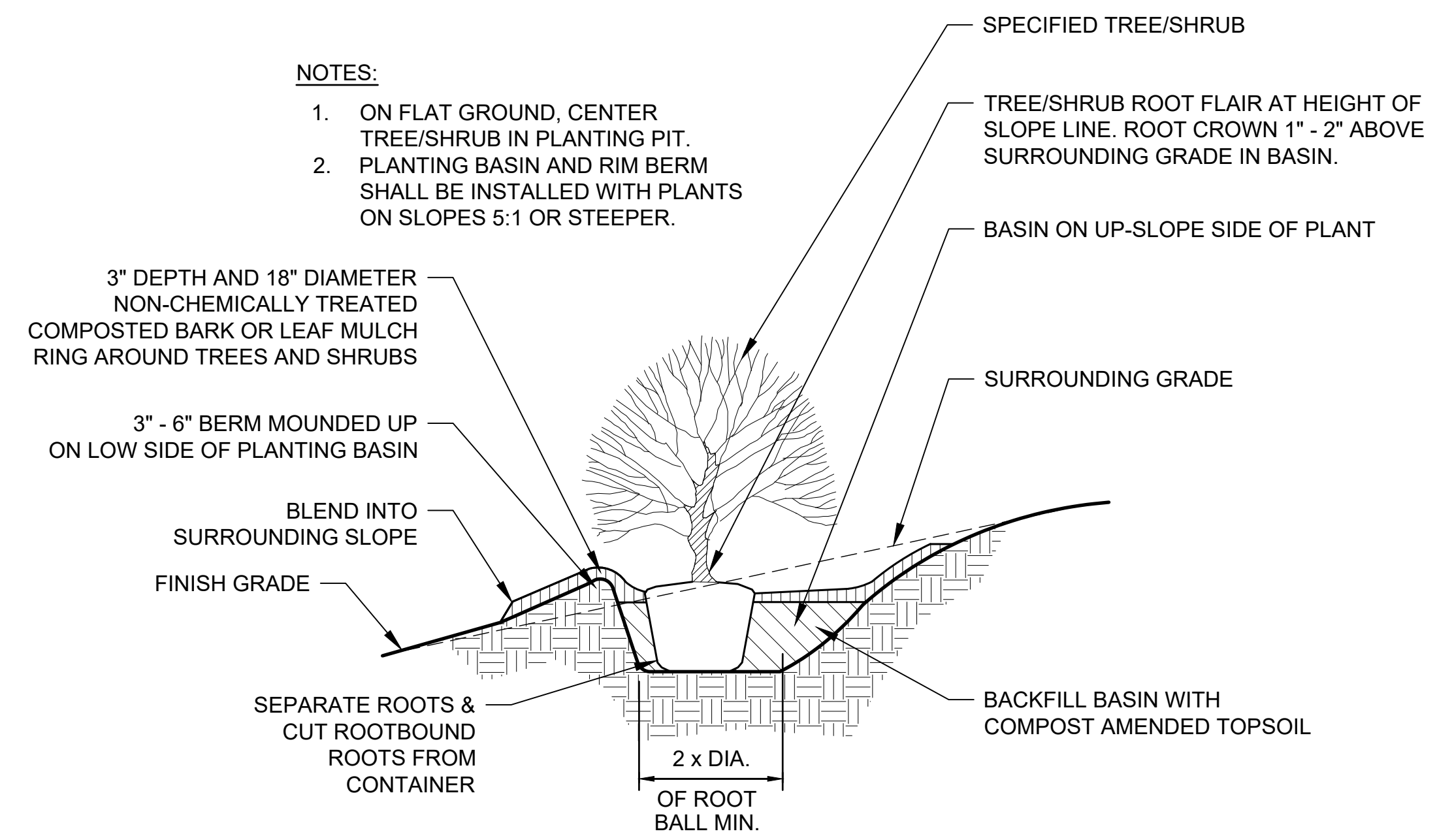
1. PLANTING ENLARGEMENT IS REPRESENTATIVE OF PLANTING. TO BE USED AS REFERENCE ONLY.
2. SHRUBS TO BE PLANTED IN SAME-SPECIES CLUSTERS OF 3-4, WITH EACH CLUSTER PLANTED 8-10' O.C. DISTRIBUTED THROUGHOUT THE PLANTING AREA.

**LEGEND**



**TYPICAL PLANTING DETAIL - 50' LENGTH (TYP)**

SCALE: 1" = 5'-0"



**TREE/SHRUB PLANTING INSTALLATION**

NOT TO SCALE

PROJECT  
**CALAROGA SANITARY SEWER PUMP  
 STATION REPLACEMENT PROJECT**  
 WEST LINN, OREGON

SHEET TITLE

**PLANTING DETAILS**

NO. DATE REVISION BY

30% PLANS

**PRELIMINARY**

DATE: 07/28/23  
 DESIGN: T. DANISCH  
 DRAWN: K. ROPERT, DANISCH

SHEET NO.

**L02**

PROJECT NO. CARO0000-4021

Plot Date: 26-JUL-2023 6:43:02 PM User: svcPW Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo\_Stg\_Pen\_v0905.pen PlotScale: 1:1 LAST SAVED BY: lumadhay

**GENERAL NOTES:**

- USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH PROJECT DRAWINGS BY OTHER DISCIPLINES AND WITH THE SPECIFICATIONS.
- UNLESS DETAILED, SPECIFIED, OR INDICATED OTHERWISE, CONSTRUCTION SHALL BE AS INDICATED IN THE GENERAL NOTES AND TYPICAL DETAILS.
- PRESENTATION CONVENTIONS FOR STRUCTURAL DRAWINGS:
  - SCREENED LINE WORK INDICATES EXISTING CONDITIONS.
  - WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED SIZES.
  - PLANS ARE TREATED AS HORIZONTAL SECTIONS. (I.E.: "PLAN AT ELEVATION 110" SHOWS CONSTRUCTION AT AND BELOW ELEVATION 110.)
- VERIFY DIMENSIONS AND CONDITIONS BEFORE BEGINNING WORK. ADVISE ENGINEER IMMEDIATELY OF DISCREPANCIES BETWEEN EXISTING CONDITIONS AND DIMENSIONS, AND INFORMATION SHOWN ON THESE DRAWINGS. CONFIRM THE FOLLOWING BEFORE PREPARATION AND SUBMITTAL OF SHOP DRAWINGS:
  - DIMENSIONS AND WEIGHTS FOR EQUIPMENT SELECTED.
  - SIZES AND LOCATIONS OF EQUIPMENT PADS FOR EQUIPMENT SELECTED.
- TYPICAL DETAILS ARE INCLUDED ON THE "TS" DRAWINGS.
  - TYPICAL DETAILS ARE INTENDED TO APPLY AT LOCATIONS DESCRIBED BY THEIR TITLES, EVEN WHEN NOT SPECIFICALLY REFERENCED ON THE DRAWINGS.
  - IN STRUCTURAL TYPICAL DETAILS, ORIENTATION OF BARS IN EACH MAT OF REINFORCEMENT (WHETHER "LINES" OR "DOTS" ARE CLOSER TO THE FACE OF THE CONCRETE) IS GENERALLY ARBITRARY. SEE DRAWINGS OF EACH STRUCTURE FOR ORIENTATION REQUIRED AT THAT STRUCTURE.
- SEE CIVIL DRAWINGS FOR STRUCTURE COORDINATES. POINTS ON THE STRUCTURES TO WHICH SITE COORDINATES REFER ARE SHOWN ON THE STRUCTURAL PLANS.
- DRAWINGS PREPARED BY OTHER DISCIPLINES INCLUDE OPENINGS, ANCHORS, PIPES, CONDUITS, AND OTHER ITEMS THAT ARE EMBEDDED INTO OR PASS THROUGH STRUCTURES.
  - CONFIRM SIZE AND LOCATIONS OF OPENINGS, PENETRATIONS AND EMBEDMENT FOR ITEMS AND EQUIPMENT FURNISHED.
  - IN GENERAL, OPENINGS, EMBEDMENTS, AND PENETRATIONS LESS THAN 12 INCHES IN DIAMETER ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS.
  - SEE MECHANICAL DRAWINGS FOR DETAILS OF PIPE PENETRATIONS, PIPE SUPPORTS, AND ASSOCIATED STRUCTURAL REQUIREMENTS.
  - SEE MECHANICAL DRAWINGS FOR EQUIPMENT PADS AND PIPE SUPPORTS.

**STRUCTURAL DESIGN CRITERIA - GENERAL:**

SEE DRAWINGS OF INDIVIDUAL STRUCTURES FOR SPECIFIC DESIGN CRITERIA BASED ON THESE OVERALL CRITERIA FOR THE SITE.

- BUILDING CODE:**
  - 2022 OREGON STRUCTURAL SPECIALTY CODE (OSSC) WITH ASCE 7-16 INCLUDING SUPPLEMENTS 1, 2, & 3.
- STRUCTURE RISK CATEGORY: III.
- DEAD LOADS:** CALCULATED FOR STRUCTURE SELF-WEIGHT.
- LIVE LOADS:**
  - H20 TRUCK
- FLUID PRESSURE LOADS:** 63 PSF/FT (UNO).
- WIND DESIGN DATA:**
  - SPECIAL WIND REGION: NO
  - WIND-BORNE DEBRIS REGION: NO
  - BASIC WIND SPEED (3 SEC GUST, 33 FEET ABOVE GROUND): 103 MPH.
- EARTHQUAKE DESIGN DATA:**
  - SITE CLASS: C
  - MAPPED SPECTRAL RESPONSE ACCELERATIONS:  $S_s = 0.2 \text{ SECOND}$   $S_1 = 0.384 \text{ g}$
  - SITE COEFFICIENTS:  $F_a = 1.2$   $F_v = 1.5$
  - MAXIMUM CONSIDERED ACCELERATIONS:  $S_{ms} = 1.035 \text{ g}$   $S_{m1} = 0.576 \text{ g}$
  - DESIGN SPECTRAL RESPONSE ACCELERATIONS:  $S_{ds} = 0.690 \text{ g}$   $S_{d1} = 0.384 \text{ g}$  (\* 5% DAMPED).
- FLOOD LOADS:**
  - FLOOD HAZARD AREA: YES
    - REFERENCE MAP ("FIRM"): 41005C0019D
    - DESIGN FLOOD ELEVATION: 44.0 RETURN INTERVAL: 100 YEAR
- CONSTRUCTION LOADS:** STRUCTURES HAVE BEEN DESIGNED FOR OPERATING LOADS ON COMPLETED FACILITIES. UNTIL CONSTRUCTION IS COMPLETE AND MEMBERS HAVE ACHIEVED THEIR DESIGN STRENGTH, PROTECT STRUCTURES AS REQUIRED BY SHORING, BRACING, AND BALANCING.

**GEOTECHNICAL REPORT / FOUNDATION DESIGN CRITERIA:**

- GEOTECHNICAL INVESTIGATION REPORT:
 

TITLE: \_\_\_\_\_

PREPARED BY: \_\_\_\_\_

REPORT NO: \_\_\_\_\_ DATED: \_\_\_\_\_
- FOUNDATION DESIGNS ARE BASED ON RECOMMENDATIONS IN THE GEOTECHNICAL INVESTIGATION REPORT.
  - NET ALLOWABLE BEARING PRESSURE SEE PLANS.
  - FROST DEPTH: \_\_\_\_\_
  - LATERAL EARTH PRESSURE (UNO): SURCHARGE: EQUIVALENT TO 2 FEET OF SOIL ABOVE FINISHED GRADE.
 

	STATIC	SEISMIC
ACTIVE (PSF/FT):	_____	_____
AT REST (PSF/FT):	_____	_____
PASSIVE (PSF/FT):	_____	_____
SLIDING COEFFICIENT OF FRICTION:	_____	_____
  - GROUNDWATER EL \_\_\_\_\_

**TYPICAL STRUCTURAL MATERIALS:**

- MATERIALS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
  - SEE PROJECT SPECIFICATIONS AND NOTES ON DRAWINGS OF SPECIFIC STRUCTURES FOR DETAILED AND LOCATION-SPECIFIC REQUIREMENTS.

**REINFORCING STEEL (FOR CONCRETE AND MASONRY):**

- DEFORMED BARS:
  - TYPICAL: ASTM A 615, GRADE 60.
  - WHERE INDICATED ON THE DRAWINGS: ASTM A 706.
- WELDED WIRE FABRIC: ASTM A 1064.
- PRESTRESSING STRANDS: ASTM A 416, 270 KSI YIELD STRENGTH, 7-WIRE.
- HORIZ JOINT REINF (FOR MASONRY: ASTM A 951, 3/16" DIA x 2 RODS), GALV.

**CONCRETE:**

- NORMAL DENSITY.
- MINIMUM SPECIFIED CONCRETE COMPRESSIVE STRENGTH,  $f_c$  (AT 28 DAYS UNO).
  - STRUCTURES: "CLASS A"  $f_c = 4000 \text{ PSI}$ .
  - FILL AND THRUST BLOCKS: "CLASS C"  $f_c = 2500 \text{ PSI}$ .
  - PIPE ENCASEMENT: "CLASS A"  $f_c = 4000 \text{ PSI}$ .
  - ELECTRICAL DUCT ENCASEMENT: "CLASS CE"  $f_c = 2500 \text{ PSI}$ .
  - PRECAST: "CLASS D"  $f_c = 5000 \text{ PSI}$ .

**STRUCTURAL STEEL:**

- SECTIONS
  - SHAPES W, WT: ASTM A 992 ( $F_y = 50 \text{ KSI}$ )
  - SHAPES S, ST, M, MT, HP, C, MC, L: ASTM A 36 ( $F_y = 36 \text{ KSI}$ )
  - PLATES AND BARS: ASTM A 36 ( $F_y = 36 \text{ KSI}$ )
  - PIPES: ASTM A 53, GRADE B ( $F_y = 35 \text{ KSI}$ )
  - HOLLOW STRUCTURAL SECTIONS:
    - ROUND: ASTM A 500, GRADE B ( $F_y = 42 \text{ KSI}$ )
    - SQUARE AND RECTANGULAR: ASTM A 500, GRADE B ( $F_y = 46 \text{ KSI}$ )
- CONNECTIONS:
  - BOLTS - STEEL TO-STEEL: ASTM F 3125 GRADE A325 HIGH-STRENGTH BOLTS, WITH LOAD INDICATOR WASHERS.
  - BOLTS - STEEL TO CONCRETE: ANCHOR BOLTS WITH HEX FORGED HEAD. ASTM F 593, STAINLESS TYPE 316 (304)
  - WELDS - SHIELDED METAL ARC PROCESS USING E70-XX ELECTRODES.

**STAINLESS STEEL:**

- ANSI TYPE 316/316L EXCEPT WHERE TYPE 304/304L IS INDICATED ON THE DRAWINGS.
- SECTIONS: SHAPES AND BARS: ASTM A 276.
- BOLTED CONNECTIONS - BOLTS AND ANCHOR BOLTS:
  - MATCH ALLOY OF THE STRUCTURAL MEMBERS CONNECTED.
  - TYPE 316/316L: ASTM F 593, GRADE B8M, CLASS 1, HEAVY HEX.
  - TYPE 304/304L: ASTM F 593, GRADE B8, CLASS 1, HEAVY HEX.
- WELDED CONNECTIONS:
  - TYPE 316L: E316L-15 ELECTRODES.
  - TYPE 304L: E304L-15 ELECTRODES.

**STRUCTURAL ALUMINUM:**

- SECTIONS
  - SHAPES: ASTM B 308, ALLOY 6061-T6.
  - SHEET AND PLATE: ASTM B 209, ALLOY 6061-T6.
- BOLTED CONNECTIONS - BOLTS AND ANCHOR BOLTS:
  - STAINLESS STEEL - TYPE 316, ASTM F 593, GRADE B8M, CLASS 1, HEAVY HEX.
- WELDED CONNECTIONS:
  - GAS METAL ARC (MIG) OR GAS TUNGSTEN ARC (TIG) PROCESS USING FILLER ALLOY 4043 ELECTRODES.

**CONSTRUCTION:**

CONFORM TO THE FOLLOWING REQUIREMENTS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

**EXCAVATION AND BACKFILLING:**

- EXPOSE AND PREPARE SUBGRADE AS SHOWN ON THE DRAWINGS AND SPECIFIED. OBTAIN ENGINEER'S OBSERVATION OF SUBGRADE SURFACES, AS EXPOSED AND AS PREPARED, BEFORE PROCEEDING WITH FOUNDATION CONSTRUCTION.
- DO NOT PLACE BACKFILL AGAINST WALLS UNTIL STRUCTURES SUPPORTING THE TOP OF THE WALL ARE IN PLACE, ARE COMPLETE, AND (IN THE CASE OF CONCRETE) HAVE CURED TO THEIR MINIMUM SPECIFIED 28-DAY COMPRESSIVE STRENGTH.
- WHERE BACKFILL MUST BE PLACED AGAINST WALLS BEFORE STRUCTURES ABOVE ARE COMPLETE, PROVIDE BRACING FOR WALLS. KEEP BRACING IN PLACE UNTIL THE STRUCTURE ABOVE IS COMPLETE AND (IN THE CASE OF CONCRETE) HAS CURED TO ITS MINIMUM SPECIFIED 28-DAY COMPRESSIVE STRENGTH.

**CONCRETE:**

- SEE S101/TYP FOR CONCRETE NOTES, INCLUDING CLEAR COVER AND LAP SPlice LENGTH REQUIREMENTS FOR REINFORCING.
- SUBMIT LOCATIONS OF CONSTRUCTION JOINTS NOT SHOWN ON THE DRAWINGS FOR ACCEPTANCE BY THE ENGINEER BEFORE FORM LAYOUT.
- PROVIDE CHAMFER AT EXPOSED EDGES OF CAST-IN-PLACE CONCRETE. SEE SPECIFICATION 03102 FOR CHAMFERS.
- PROVIDE REINFORCING:
  - AT CORNERS AND JUNCTIONS - AS INDICATED IN S144/TYP, SUPPLEMENT WITH ADDED BARS WHERE INDICATED ON THE DRAWINGS.
  - AT OPENINGS - AS INDICATED IN S180/TYP.
- WELDING OF REINFORCING IS NOT PERMITTED UNLESS DETAILED ON THE DRAWINGS OR ACCEPTED IN ADVANCE BY THE ENGINEER.
- MAINTAIN MINIMUM 3 INCHES CLEAR CONCRETE COVER BETWEEN REINFORCING AND EMBEDMENTS.
- FINISH CONCRETE AS SPECIFIED IN SECTION 03366.
- CONCRETE PADS
  - EQUIPMENT PAD SEE S302/TYP.
  - HOUSEKEEPING PAD FOR ELECTRICAL EQUIPMENT SEE S350/TYP.

**STEEL, STAINLESS STEEL, AND ALUMINUM - CONNECTIONS:**

- BOLTED:
  - MADE USING 3/4-INCH DIAMETER BOLTS.
  - HAVING A MINIMUM OF 2 BOLTS, SPACED NOT CLOSER THAN 3 INCHES ON CENTER.
  - WITH A DISTANCE OF AT LEAST 1 1/2 INCHES FROM CENTER OF BOLT TO ANY EDGE OF A PLATE OR STRUCTURAL ELEMENT.
- WELDED:
  - FILLET WELDS: PER AWS CODE BASED ON THE THICKNESS OF THE MATERIALS BEING JOINED, AND FULL LENGTH OF THE JOINT.
- INTERFACE BETWEEN MATERIALS:
  - AT BOLTED CONNECTIONS THAT INCLUDE DIFFERENT METALS (E.G.: STEEL AND STAINLESS STEEL, OR ALUMINUM AND STEEL) PROVIDE MYLAR ISOLATING SLEEVES AND PHENOLIC WASHERS.
  - WHERE ALUMINUM IS IN CONTACT WITH MASONRY OR CONCRETE, COAT ALUMINUM SURFACES WITH EPOXY MASTIC.
- POST-INSTALLED ANCHORS IN CONCRETE AND MASONRY:
  - INSTALL IN FULL COMPLIANCE WITH ACCEPTED BUILDING CODE EVALUATION REPORT AND MANUFACTURER'S INSTRUCTIONS.
  - DO NOT CUT, DAMAGE, OR INTERRUPT EXISTING REINFORCEMENT TO INSTALL ANCHORS. USE NON-DESTRUCTIVE TESTING EQUIPMENT TO IDENTIFY LOCATIONS OF REINFORCEMENT IN MEMBERS BEFORE DRILLING HOLES FOR ANCHORS.

**METAL FABRICATIONS:**

- HANDRAILS AND GUARDRAILS:
  - ALUMINUM, EXCEPT WHERE OTHER MATERIALS ARE NOTED.
- GRATING:
  - ALUMINUM WITH TYPE 316 STAINLESS STEEL FASTENERS, UNLESS OTHERWISE NOTED.
  - GRATING AND ITS SEATS OR SUPPORTS SHALL BE OF THE SAME MATERIAL.
  - UNLESS INDICATED ON THE DRAWINGS AS "REMOVABLE GRATING", SECURELY FASTEN GRATING TO SUPPORTS.
- COVER PLATES:
  - ALUMINUM WITH TYPE 316 STAINLESS STEEL FASTENERS, UNLESS OTHERWISE NOTED.
  - COVER PLATE AND ITS SEATS OR SUPPORTS SHALL BE OF THE SAME MATERIAL.

**SPECIAL INSPECTION:**

- SPECIAL INSPECTION IS REQUIRED FOR THE FOLLOWING STRUCTURAL MATERIALS AND CONSTRUCTION. SEE SPECIFICATION SECTION 01455 FOR DETAILS.
- DIVISION 2 SITE CONSTRUCTION (EARTHWORK)
  - EXCAVATION DEPTH.
  - ADEQUACY OF EXPOSED SURFACE TO PROVIDE REQUIRED SUPPORT.
  - PREPARATION OF SOILS/SURFACES SUPPORTING CONSTRUCTION.
  - FILL AND BACKFILL.

**STRUCTURAL OBSERVATION:**

- STRUCTURAL OBSERVATION IS REQUIRED FOR THE FOLLOWING STAGES OF GABION RETAINING WALL CONSTRUCTION
  - AFTER EXCAVATION AND PRIOR TO PLACING ANY GABION BASKETS.
  - WHEN PLACING FIRST COURSE OF GABION BASKETS.
  - PRIOR TO COMPLETION OF RETAINING WALL WHEN CORRECTONS CAN BE MADE.

**STRUCTURAL SYMBOLS:**

- SEE DRAWING \_\_\_\_\_ FOR KEY TO DRAWING TITLES AND SECTION CUTS, AND FOR DEFINITION OF MATERIALS SHADING PATTERNS.
- WELDING: SYMBOLS: IN ACCORDANCE WITH AMERICAN WELDING SOCIETY (AWS) A2.4.

**STRUCTURAL ABBREVIATIONS:**

- SEE DRAWING \_\_\_\_\_ FOR GENERAL LIST OF ABBREVIATIONS USED ON DRAWINGS
- ABBREVIATIONS FOR NAMES OF TECHNICAL GROUPS MAY BE FOUND IN THE PROJECT SPECIFICATIONS.
- STRUCTURAL MEMBERS:
  - STEEL: ABBREVIATIONS AND DESIGNATIONS ARE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION'S STEEL CONSTRUCTION MANUAL, CURRENT EDITION.
  - ALUMINUM: ABBREVIATIONS AND DESIGNATIONS ARE IN ACCORDANCE WITH THE ALUMINUM ASSOCIATION'S ALUMINUM DESIGN MANUAL, CURRENT EDITION.
- ABBREVIATIONS FOR STRUCTURAL DRAWINGS: WHEN USED ON THE STRUCTURAL DRAWINGS, THE FOLLOWING ABBREVIATIONS HAVE THE MEANINGS LISTED.
 

REINFORCEMENT:	OTHER:
BO BOTTOM OF	L ANGLE
EF EACH FACE	PL PLATE
I.F. INSIDE FACE	
O.F. OUTSIDE FACE	
T.O. TOP OF	
# NUMBER (REINFORCING BAR SIZE)	
H1E HOOK ONE END	

**DEFERRED DESIGN SUBMITTALS**

AS DEFINED IN THE BUILDING CODE, DEFERRED DESIGN SUBMITTALS ARE PORTIONS OF THE DESIGN THAT ARE NOT SUBMITTED AT THE TIME OF PERMIT APPLICATION, AND THAT ARE TO BE REVIEWED BY THE REGISTERED DESIGN PROFESSIONAL AND SUBSEQUENTLY SUBMITTED TO THE BUILDING OFFICIAL.

DEFERRED DESIGN SUBMITTALS FOR THIS PROJECT INCLUDE:

- DIVISION 2 SITE CONSTRUCTION (EARTHWORK).
  - 02338 GABION BASKET RETAINING WALLS.
- DIVISION 5 METALS.
  - 05500 HANDRAILS AND GUARDRAILS.

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED	MED		
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CHECKED			
DATE	JULY 2023		
REV	DATE	BY	DESCRIPTION
1			
2			
3			

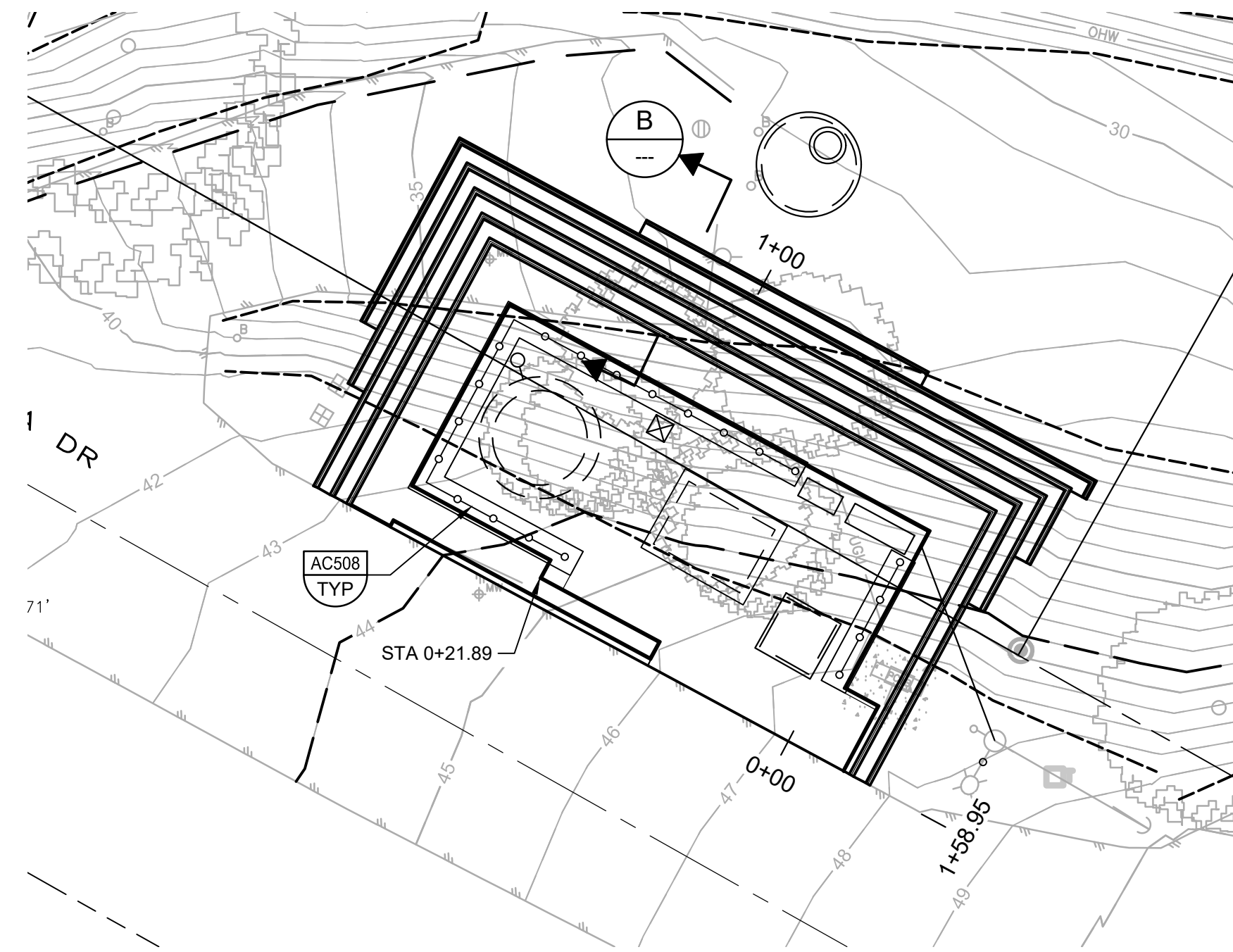
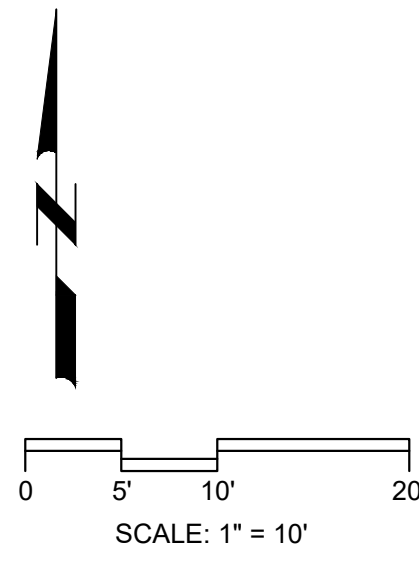
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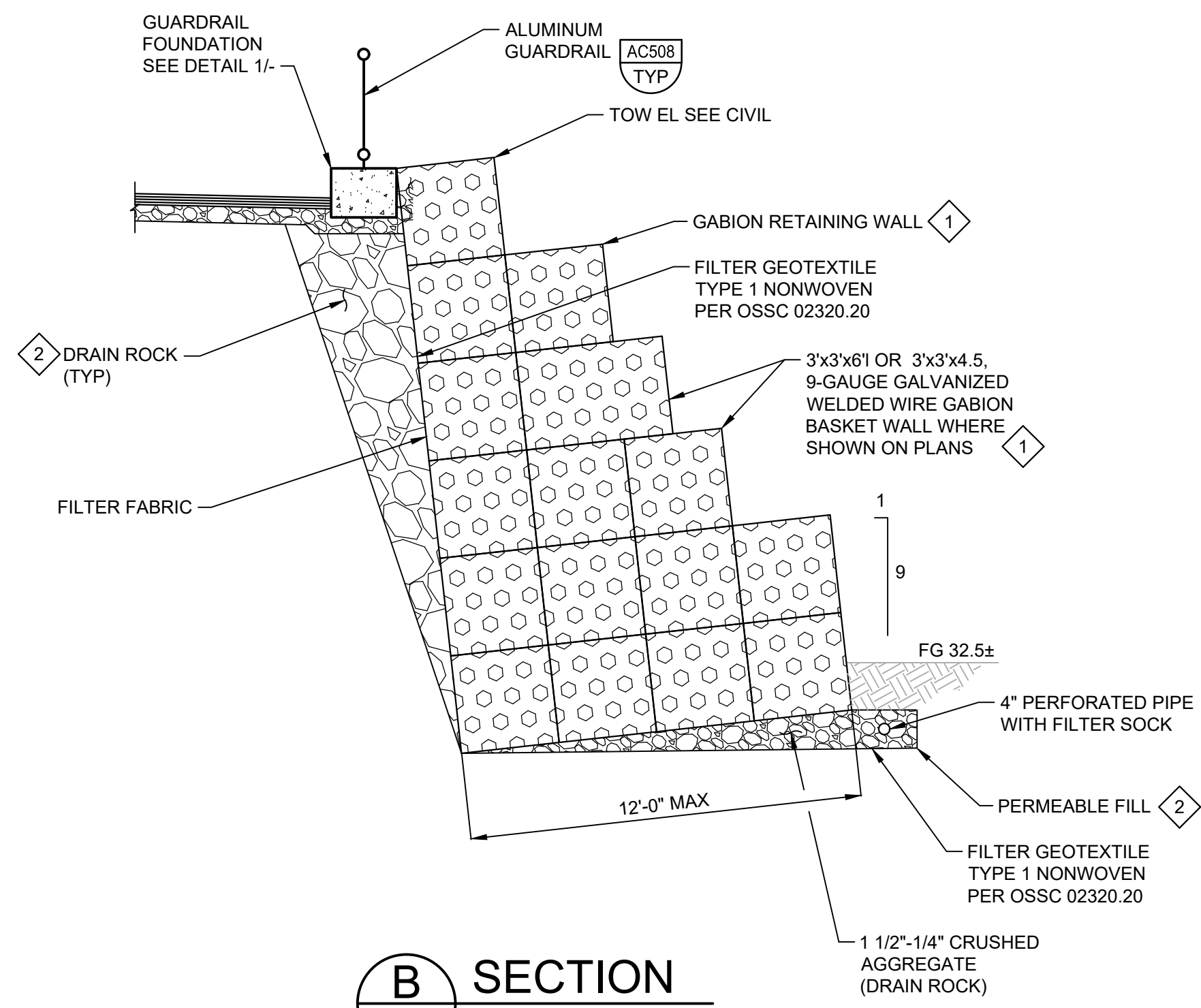
CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 GENERAL STRUCTURAL NOTES

VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. GS01
0  1"	SHEET NO. OF XX
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

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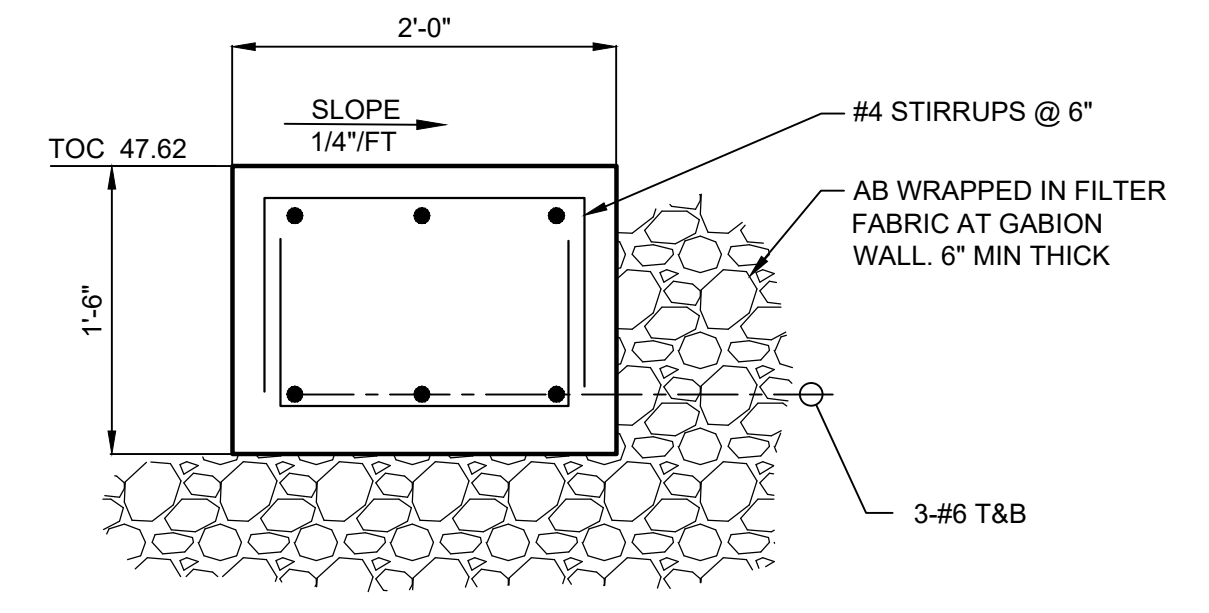


**A** WALL PLAN  
SCALE: 1" = 10'  
FILE: 20177900C0101

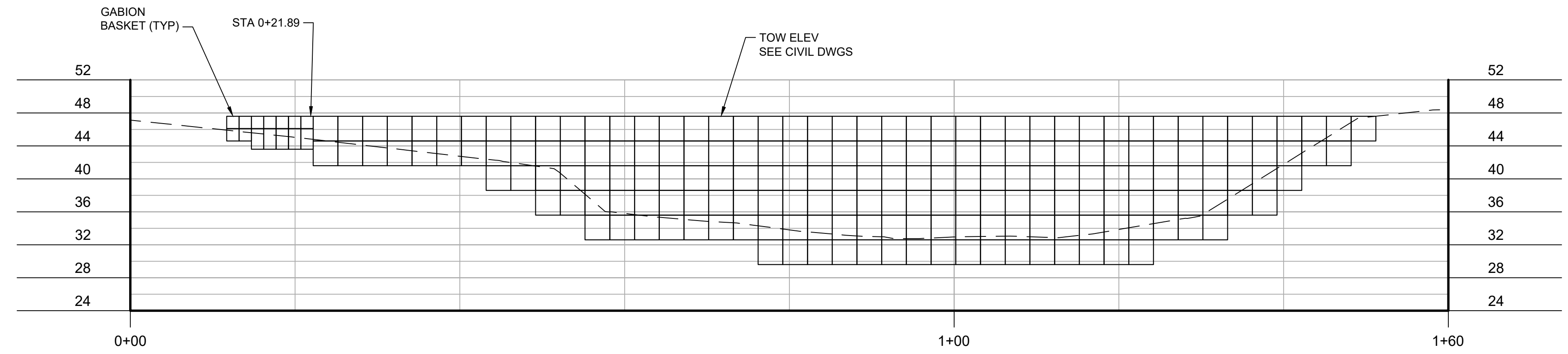


**B** SECTION  
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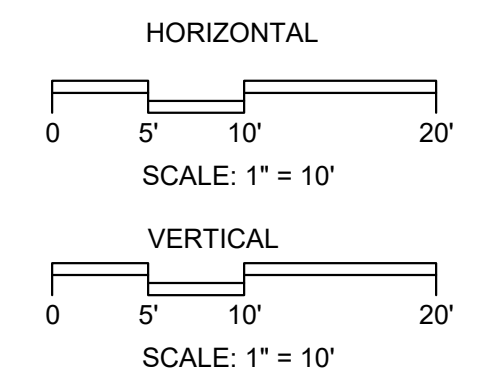
- KEY NOTES:**
- GABION WALL BASKET RETAINING WALL REFER TO FHWA DETAIL W253-1 AND SECTION 02338.
  - REFER TO SECTION 02050 FOR AGGREGATES FOR EARTHWORK.



**1** DETAIL  
SCALE: 1" = 1'-0"  
FILE: 20177900C0801



**WALL DEVELOPED ELEVATION**  
FILE: 20177900C0801



LAST SAVED BY: Alajico

**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

REV	DATE	BY	DESCRIPTION
1			
2			

DESIGNED MSS
DRAWN SCR
CHECKED
DATE JULY 2023



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
STRUCTURAL  
RETAINING WALL PLAN AND SECTIONS

VERIFY SCALES	JOB NO. 201779
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User: svcPW

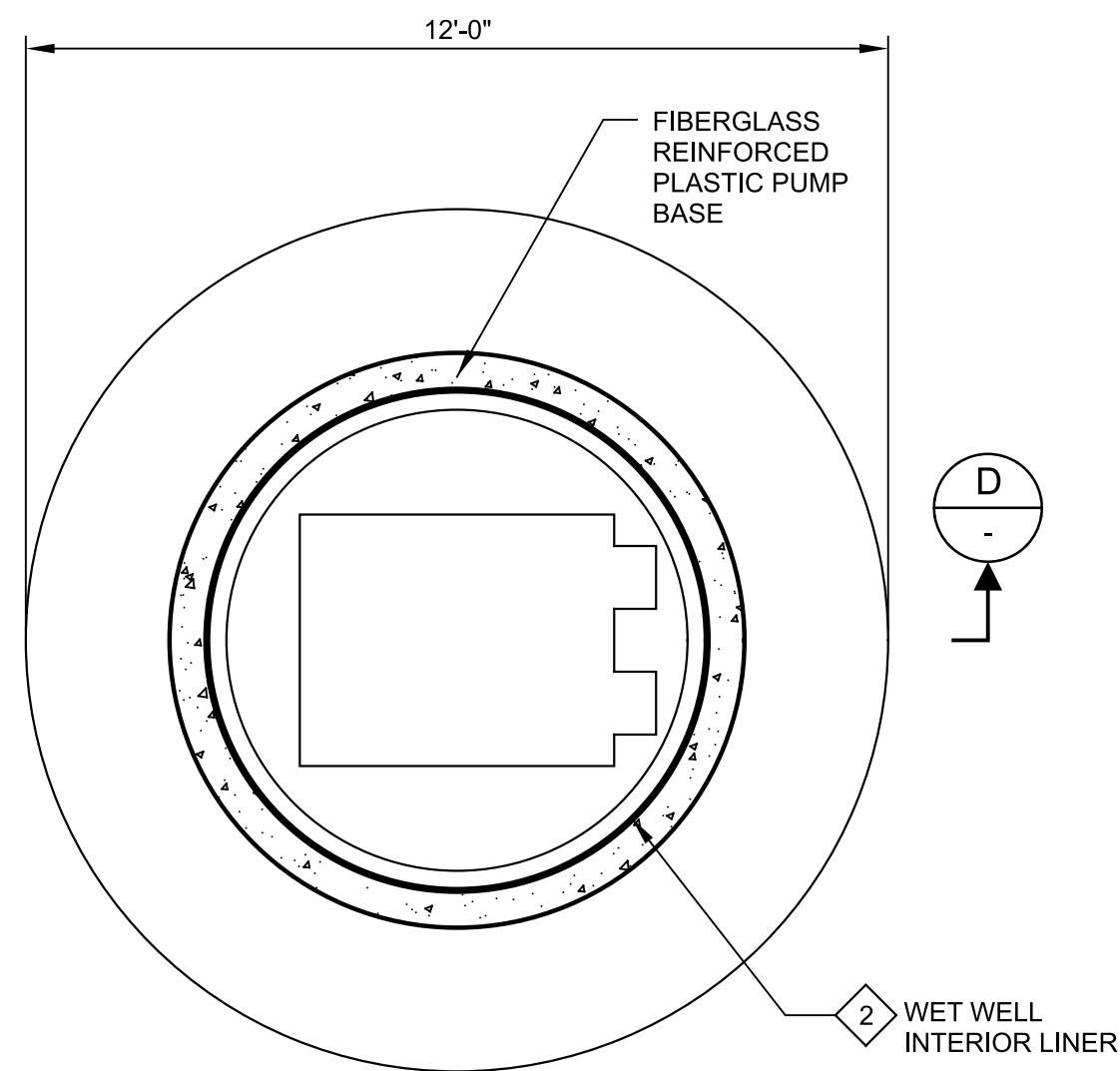
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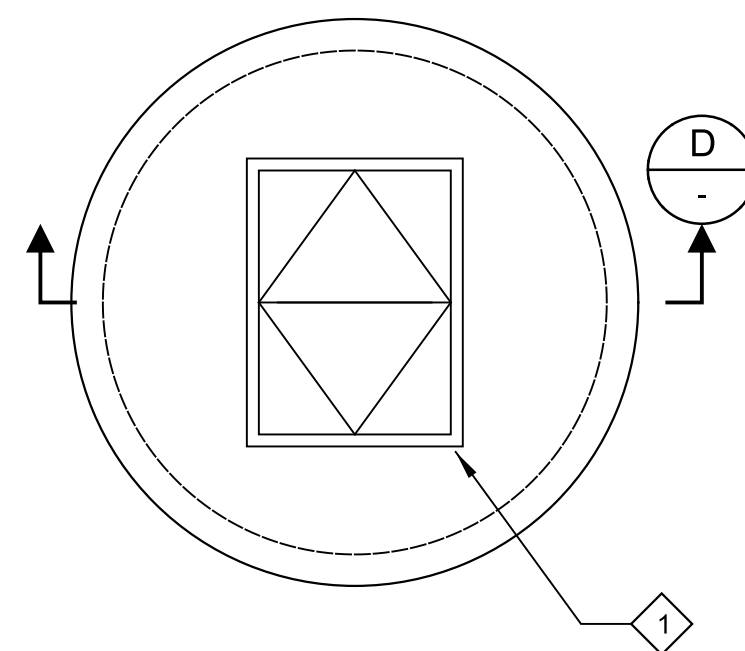
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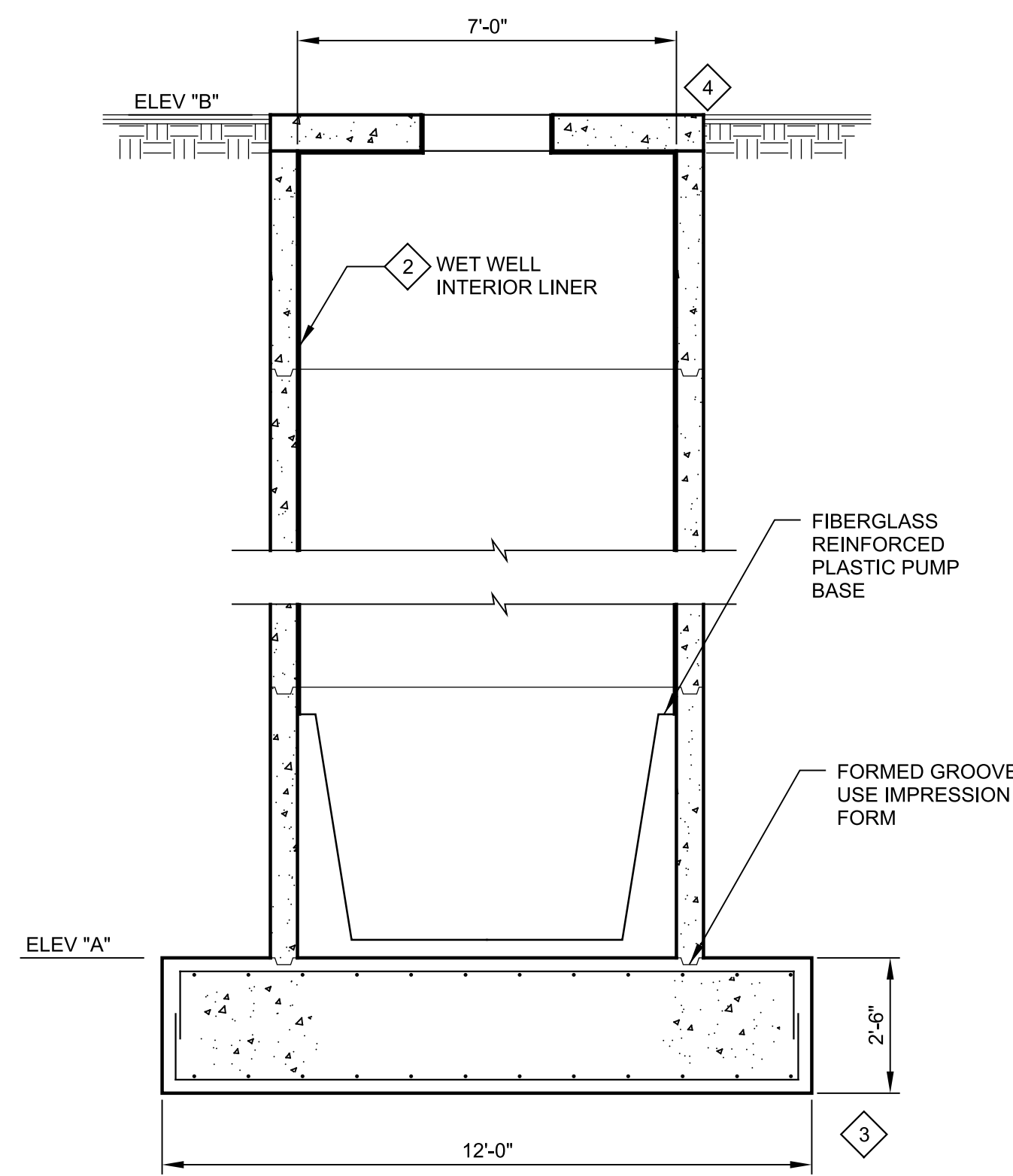
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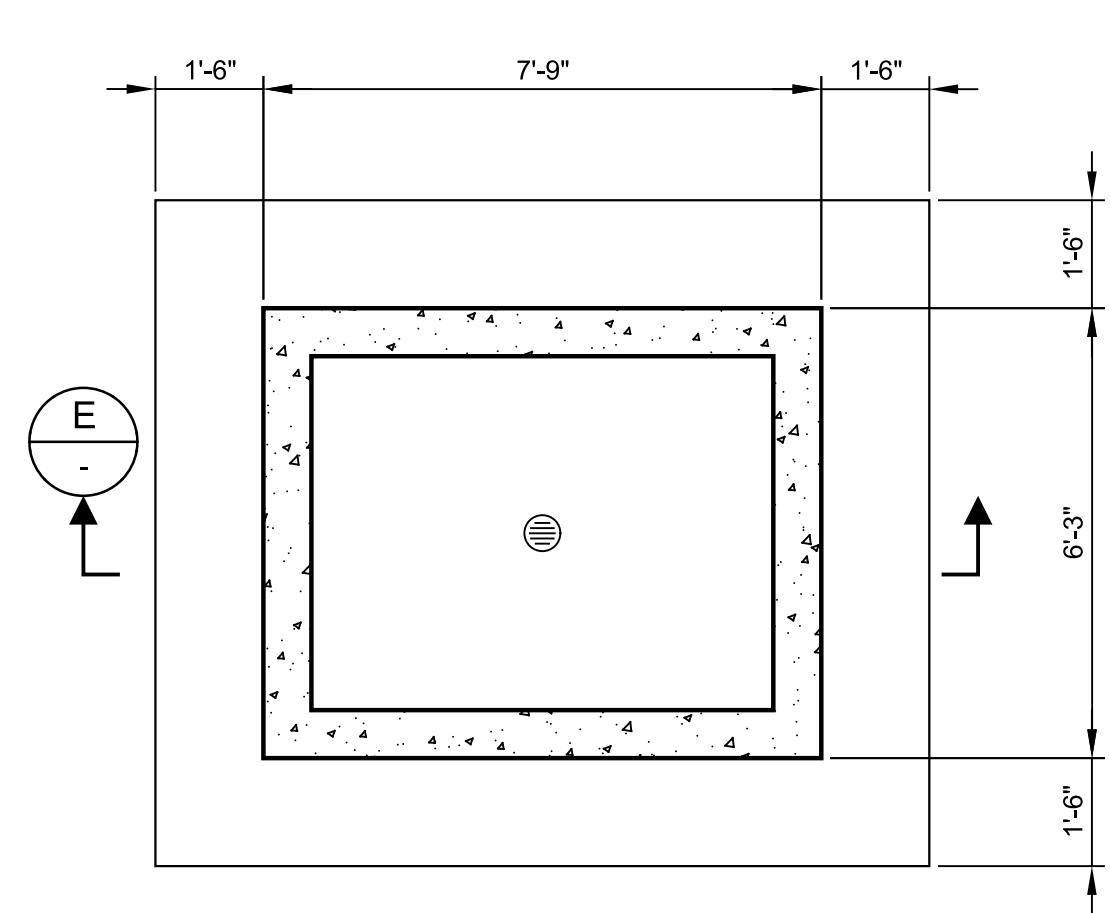
**2 WET WELL FOUNDATION PLAN**  
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FILE: 20177900S101



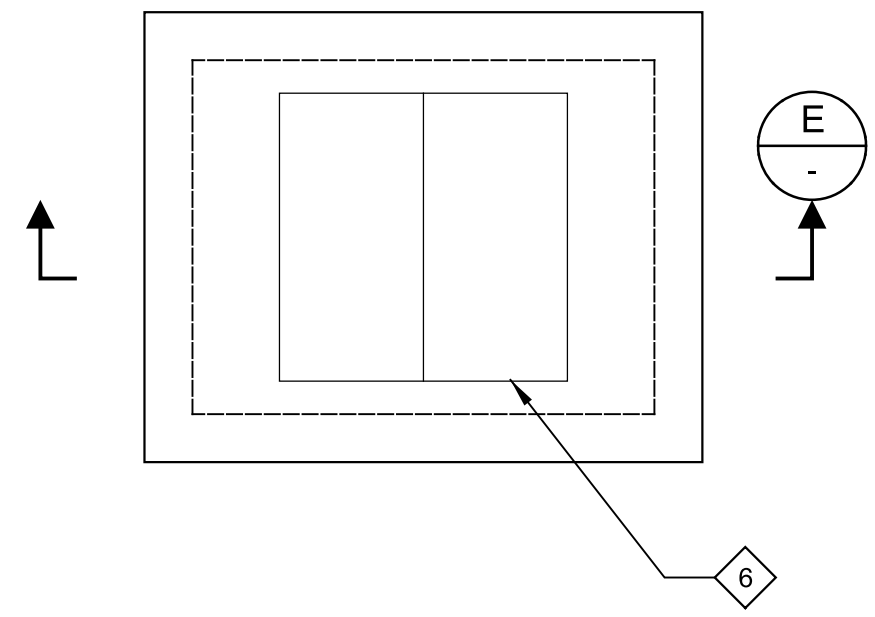
**3 WET WELL TOP PLAN**  
SCALE: 3/8"=1'-0"  
FILE: 20177900S101



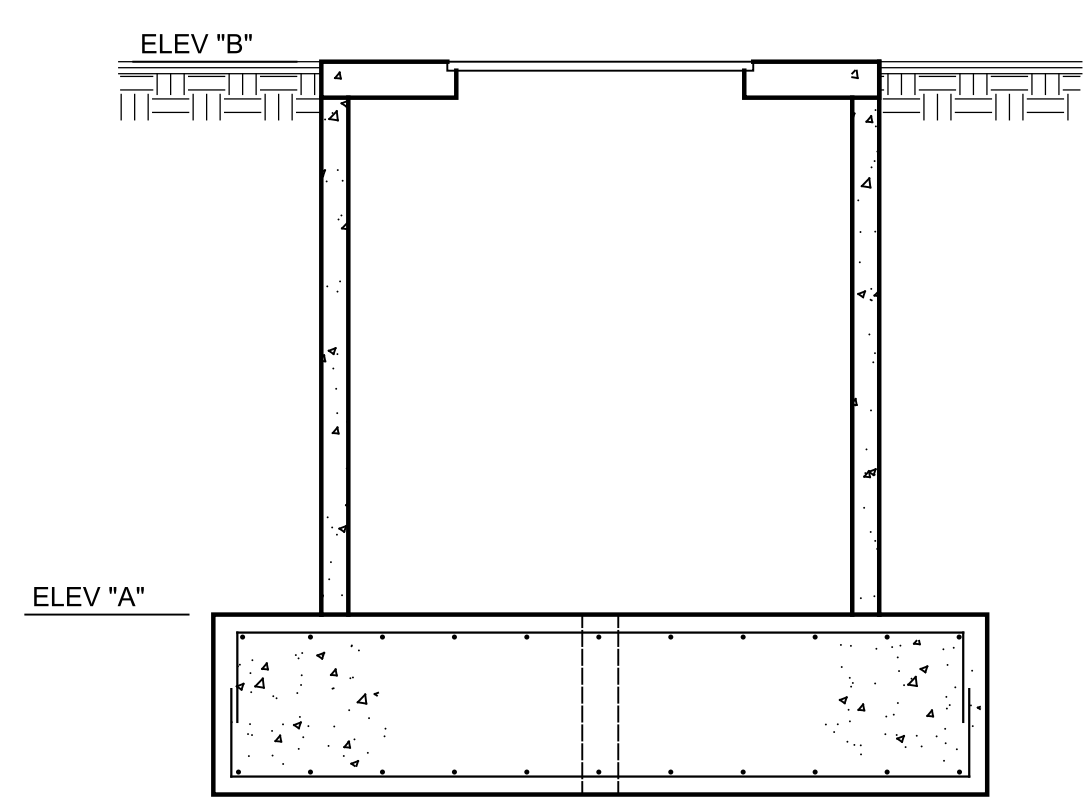
**D SECTION**  
SCALE: 3/8"=1'-0"  
FILE: 20177900S301



**4 VAULT FOUNDATION PLAN**  
SCALE: 3/8"=1'-0"  
FILE: 20177900S102



**5 VAULT TOP PLAN**  
SCALE: 3/8"=1'-0"  
FILE: 20177900S102



**E SECTION**  
SCALE: 3/8"=1'-0"  
FILE: 20177900S302

**GENERAL NOTES:**

1. PRECAST WET WELL AND VALVE VAULT SECTIONS, INCLUDING TOP AND BOTTOM SLABS, TO BE DESIGNED BY PRECAST MANUFACTURER. SEE SPECIFICATION SECTION 02085.
2. SEE SCHEDULE FOR PRECAST SECTION SIZES AND ELEVATIONS.
3. PRECAST MANUFACTURER TO COORDINATE HATCH FRAME INSTALLATION WITH HATCH MANUFACTURER.
4. CONTRACTOR TO COORDINATE LOCATION OF HATCHES WITH PUMP MANUFACTURER TO ASSURE PUMP REMOVAL.

**KEY NOTES:**

1. INSTALL DOUBLE LEAF HEAVY DUTY OFF STREET FLOOR ACCESS DOOR WITH 3'-0"x4'-0" CLEAR OPENING AND FALL PROTECTION SYSTEM PER SPECIFICATION SECTION 08320.
2. CONTRACTOR TO APPLY HIGH PERFORMANCE COATING PER SPECIFICATION SECTION 09960.
3. BASE SLAB SHALL HAVE MINIMUM DIMENSIONS AS SHOWN.
4. JOINT BETWEEN WET WELL AND SURROUNDING PAVEMENT AND/OR CONCRETE SHALL BE PER DETAIL S310/TYP.
5. SEE PLUMBING DRAWINGS FOR PIPE INVERT ELEVATIONS.
6. INSTALL DOUBLE LEAF HEAVY DUTY OFF STREET FLOOR ACCESS DOOR WITH 4'-0"x4'-0" CLEAR OPENING AND FALL PROTECTION SYSTEM PER SPECIFICATION 08320.

PRECAST WET WELL SCHEDULE			
WET WELL	ELEV "A"	ELEV "B"	SIZE
PS WET WELL	7.50	47.20	7'-0" DIA
VALVE VAULT	39.52	47.20	7'-9"x6'-3" (LxW)

PRECAST VALVE VAULT SCHEDULE			
VALVE VAULT	L x W	FLOOR	DRAIN
CALAROGA	7'-9" x 6'-3"	YES	TO CALAROGA PS

**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

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CHECKED  
DATE  
JULY 2023



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
STRUCTURAL  
WET WELL AND VALVE VAULT  
PLANS AND SECTIONS

VERIFY SCALES  
BAR IS ONE INCH ON ORIGINAL DRAWING  
0 1"  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO.  
201779  
DRAWING NO.  
**S02**  
SHEET NO.  
OF XX

Plot Date: 27-JUL-2023 10:47:11 AM

User: svcPW

PlotScale: 1:1

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ColorTable: gshade.ctb

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PROJECT NO. 201779-100000

FILE NAME: 20177900S003.dgn

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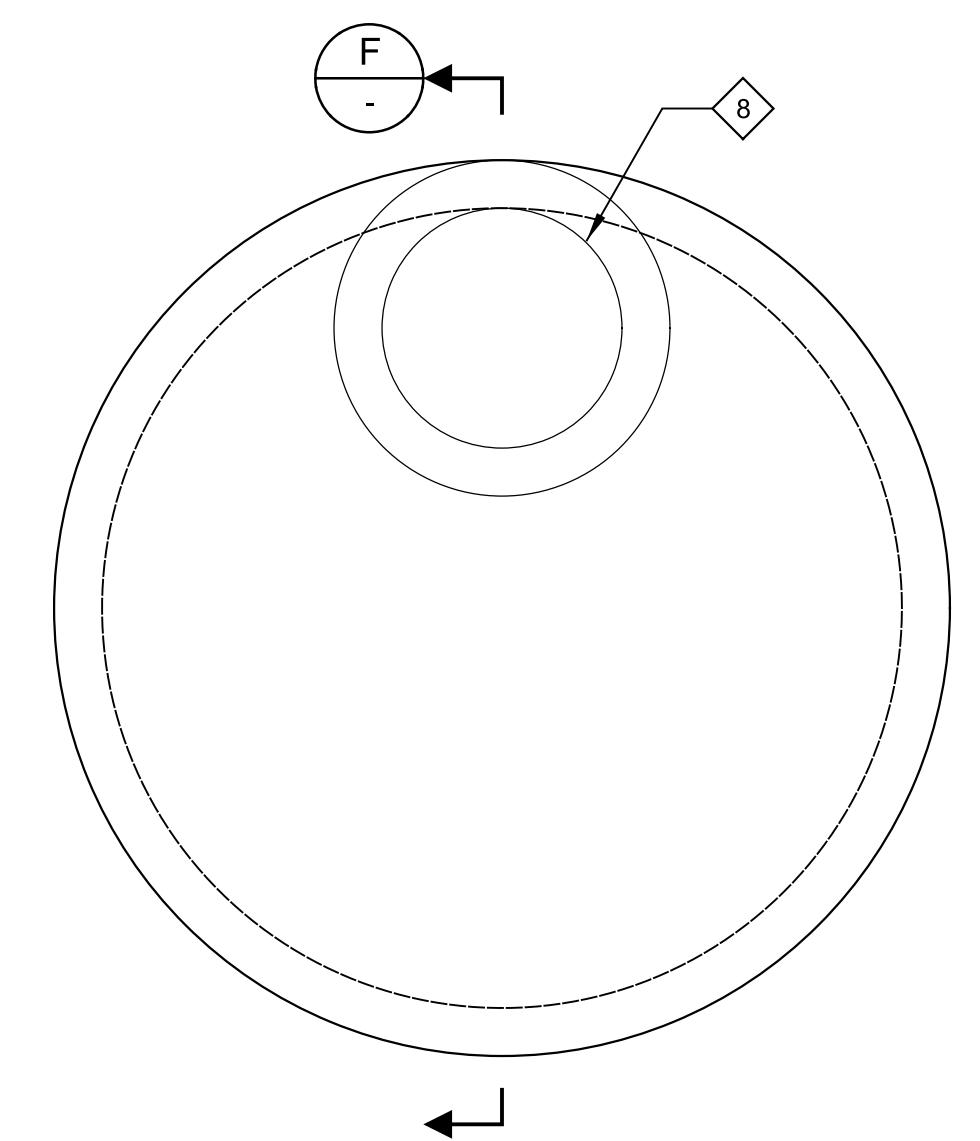
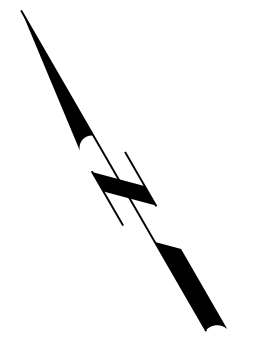
A B C D E F G

**GENERAL NOTES:**

- 1. PRECAST WET WELL AND VALVE VAULT SECTIONS, INCLUDING TOP SLAB AND RISERS, TO BE DESIGNED BY PRECAST MANUFACTURER. SEE SPECIFICATION SECTION 02085.

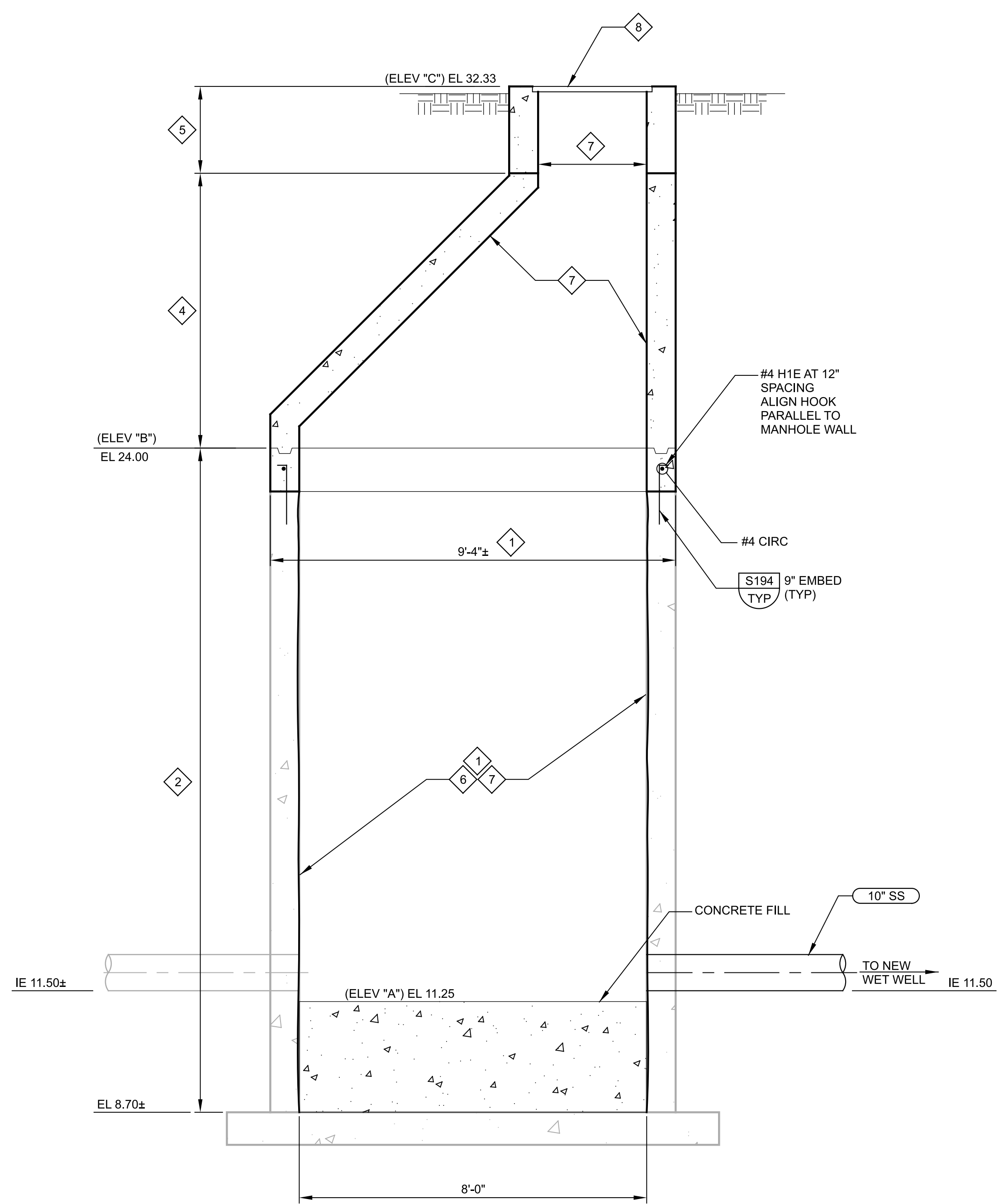
**KEY NOTES:**

- 1. FIELD VERIFY EXISTING MANHOLE DIMENSIONS. SUBMIT TO ENGINEER. ALLOW TWO WEEKS FOR ENGINEER'S REVIEW.
- 2. EXISTING WET WELL WITH NEW CAST-IN-PLACE CONCRETE TRANSITION RING. ABRASIVE BLAST CLEAN INTERIOR SURFACES.
- 3. CAST IN PLACE CONCRETE TRANSITION. MATCH EXISTING AND NEW MANHOLE WALL THICKNESS. PROVIDE GROOVED JOINT MATCHING PRECAST SECTION. FORM USING AN IMPRESSION RING. SEAL WITH JOINT SEALANT (RAMNECK OR EQUAL).
- 4. PRECAST CONCRETE ECCENTRIC MANHOLE RISER.
- 5. ADJUSTING RINGS, 2 MAX. AND PRECAST CONCRETE MANHOLE COVER WITH 24" DIAMETER MANHOLE. PROVIDE "SANITARY SEWER" CAST IN MANHOLE COVER.
- 6. ABRASIVE BLAST EXISTING MANHOLE INTERIOR. APPLY STRUCTURAL CONCRETE REPAIR MORTAR, SECTION 03923, TO RESTORE TO 2" MINIMUM, 6" MAXIMUM.
- 7. COAT ALL INTERIOR SURFACES, EXISTING AND NEW AS SPECIFIED IN SECTION 09998
- 8. 30" DIA MANHOLE COVER WITH SKID-RESISTANT GRID PATTERN STAMPED WITH "SANITARY SEWER" LABEL.



**6 WET WELL TOP PLAN**  
 SCALE: 3/8"=1'-0"  
 FILE: 20177900S101

PRECAST WET WELL SCHEDULE				
WET WELL	ELEV "A"	ELEV "B"	ELEV "C"	SIZE
ECCENTRIC RISER	NA	24.00	32.33	100" OD <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">3</span>
WET WELL	11.25	NA	NA	8'-0" INSIDE DIA



**F SECTION**  
 SCALE: 1/2"=1'-0"  
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**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

DESIGNED MED  
 DRAWN TU  
 CHECKED  
 DATE JULY 2023



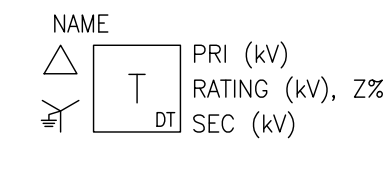
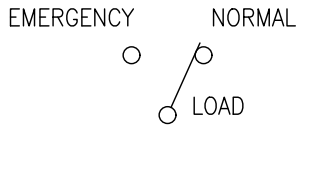
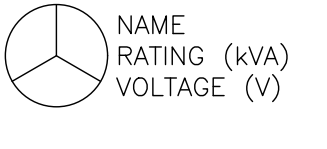
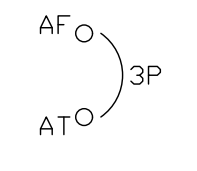
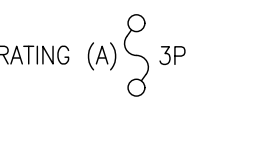
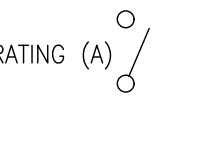
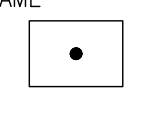
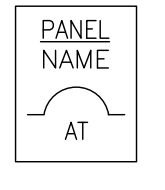
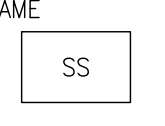
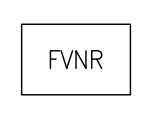
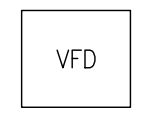

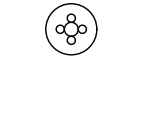
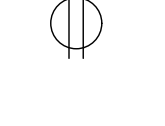
CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT  
 STRUCTURAL  
 EXISTING WET WELL MODIFICATIONS PLAN AND SECTION

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 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

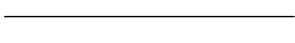
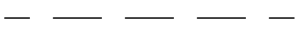
JOB NO. 201779  
 DRAWING NO. S03  
 SHEET NO. OF XX

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ELECTRICAL DRAWING INDEX			
SHEET	DWG NO.	TITLE	COMMENTS
50	E01	ELECTRICAL DRAWING INDEX, ABBREVIATIONS & SYMBOLS	-
51	E02	POWER CONDUIT LAYOUT	-
52	E03	CONTROL CONDUIT LAYOUT	-
53	E04	POWER & CONTROL CONDUCTOR/CONDUIT SCHEDULE	-
54	E05	MAIN PANEL MP-1 LAYOUT	-
55	E06	MAIN PANEL MP-1 BILL OF MATERIALS	-
56	E07	ONE-LINE DIAGRAM	-

ELECTRICAL ONE-LINE SYMBOLS	
SYMBOL	DESCRIPTION
	TRANSFORMER WITH DELTA-Y-GROUNDED CONNECTION. MAY BE SHOWN AS DELTA-DELTA, Y-DELTA, ETC. Z% = IMPEDANCE
	MANUAL TRANSFER SWITCH
	GENERATOR
	MOLDED CASE CIRCUIT BREAKER, 3 POLE UNLESS OTHERWISE NOTED AF = FRAME SIZE IN AMPS AT = TRIP RATING IN AMPS
	FUSE, 3 POLE UNLESS OTHERWISE NOTED
	DISCONNECT SWITCH
	JUNCTION BOX
	PANEL WITH MAIN BREAKER AT = TRIP RATING IN AMPS
	MOTOR SOFT STARTER
	FULL VOLTAGE NON-REVERSING MOTOR STARTER
	VARIABLE FREQUENCY DRIVE
	MOTOR
	GENERATOR RECEPTACLE
	DOUBLE RECEPTACLE

ELECTRICAL ABBREVIATIONS			
1P	1 POLE	MFR	MANUFACTURER
3P	3 POLE	MP	MAIN PANEL
A	AMPERE	MTS	MANUAL TRANSFER SWITCH
AC	ALTERNATING CURRENT	N	NEUTRAL
AF	AMPERE FRAME	P	POLE
AIC	AMPERES INTERRUPTING CURRENT	PH	PHASE
AT	AMPERE TRIP	PDP	POWER DISTRIBUTION PANEL
AWG	AMERICAN WIRE GAUGE	PFR	POWER FAIL RELAY
CB	CIRCUIT BREAKER	PNL	PANEL
CBL	CABLE	PRI	PRIMARY
CP	CONTROL PANEL	PWR	POWER
CT	CURRENT TRANSFORMER	SD	SERVICE DISCONNECT
CU	COPPER	SEC	SECONDARY
FDR	FEEDER	SPD	SURGE PROTECTIVE DEVICE
FLA	FULL LOAD AMPERES	SW	SWITCH
FS	FUSE	TX	TRANSFORMER
G	GROUND	UTIL	UTILITY
GEN	GENERATOR	V	VOLT
GND	GROUND	VA	VOLT-AMPERE
HP	HORSEPOWER	VAC	VOLTAGE ALTERNATING CURRENT
JB	JUNCTION BOX	VFD	VARIABLE FREQUENCY DRIVE
kA	KILOAMPERE	W	WATT
kcmil	THOUSAND CIRCULAR MILS	Y	WYE
kV	KILOVOLT	Z	IMPEDANCE
kVA	KILAVOLT-AMPERE		
kW	KILOWATT		
LP	LIGHTING PANEL		

ELECTRICAL LINE LEGEND	
SYMBOL	DESCRIPTION
	CONDUCTORS, PANELS OR OTHER ELECTRICAL COMPONENTS
	MAIN POWER AND CONTROL ENCLOSURE

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DESIGNED	D. DELGADO
DRAWN	E. CHOW
CHECKED	
DATE	APRIL 2023

REV	DATE	BY	DESCRIPTION
0	2/19/23	EC	CREATED

DESIGNED D. DELGADO  
DRAWN E. CHOW  
CHECKED  
DATE APRIL 2023



CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT**  
 ELECTRICAL INDEX, ABBREVIATIONS, & SYMBOLS

VERIFY SCALES  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
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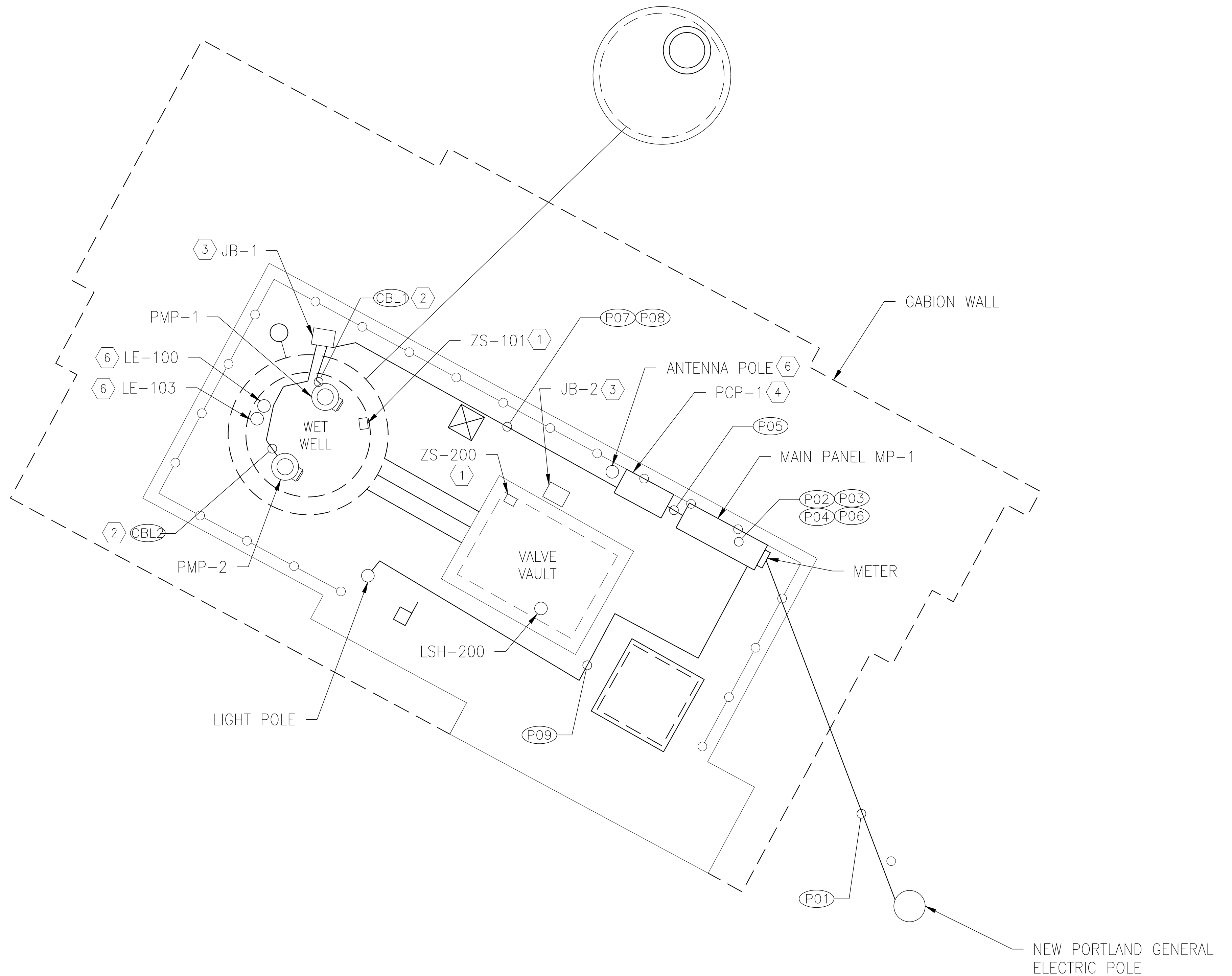
JOB NO. 201779  
 DRAWING NO. E01  
 SHEET NO. OF

SHEET NOTES:

1. ALL CONDUITS SHALL BE DIRECT BURIED. MINIMUM BURIAL DEPTH IS 24 INCHES.
2. CORE DRILL THE WET WELL AND VALVE VAULT FOR ENTRANCE OF CONDUITS. SEAL PENETRATIONS IN ACCORDANCE WITH TYPICAL DRAWING E004.
3. THE WET WELL INTERIOR IS A CLASS 1 DIVISION 1 LOCATION. THE VALVE VAULT INTERIOR IS A CLASS 1 DIVISION 2 LOCATION.
4. FOR ELECTRICAL ONE-LINE, SEE DWG. E03.
5. FOR CONDUIT/CONDUCTOR SCHEDULE, SEE DWG. E07.
6. INSTALL CONDUIT AND CONDUCTORS IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC) AND ANY APPLICABLE LOCAL CODES.

KEY NOTES:

- 1 LOCATE LIMIT SWITCHES SO THEY DO NOT INTERFERE WITH ACCESS TO THE VAULTS OR EQUIPMENT REMOVAL.
- 2 PROVIDE MESH CABLE GRIPS FOR THE PUMP CABLES.
- 3 NEMA TYPE 4X JUNCTION BOX WITH TERMINALS FOR TRANSITIONING FROM THE PUMP POWER & CONTROL CABLES AND OTHER CONTROL CABLES TO THE PUMP CONTROL PANEL WIRES. MOUNT THE JUNCTION BOX ON THE SIDE OF THE WET WELL / VALVE VAULT SIMILAR TO TYPICAL DETAIL E007. PROVIDE CONDUIT SEALS PER TYPICAL DETAIL ONLY BETWEEN THE JUNCTION BOX AND THE WET WELL. PROVIDE PVC COATED STEEL CONDUIT SLEEVES FROM THE JUNCTION BOXES INTO THE WET WELL FOR THE PUMPS AND CONTROL INTEGRAL CABLES. LOCATE THE SLEEVES TO FACILITATE BOTH REMOVAL AND REINSTALLATION OF THE EQUIPMENT.
- 4 MOUNT PCP-1 SIMILAR TO TYPICAL DETAIL E007.
- 5 MOUNT LEVEL PROBES SIMILAR TO TYPICAL DETAIL E010.
- 6 MOUNT SCADA SYSTEM ANTENNA NEXT TO PCP-1 SIMILAR TO TYPICAL DETAIL E012.



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DATE APRIL 2023			
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REV	DATE	BY	DESCRIPTION




CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 POWER CONDUIT LAYOUT

VERIFY SCALES  
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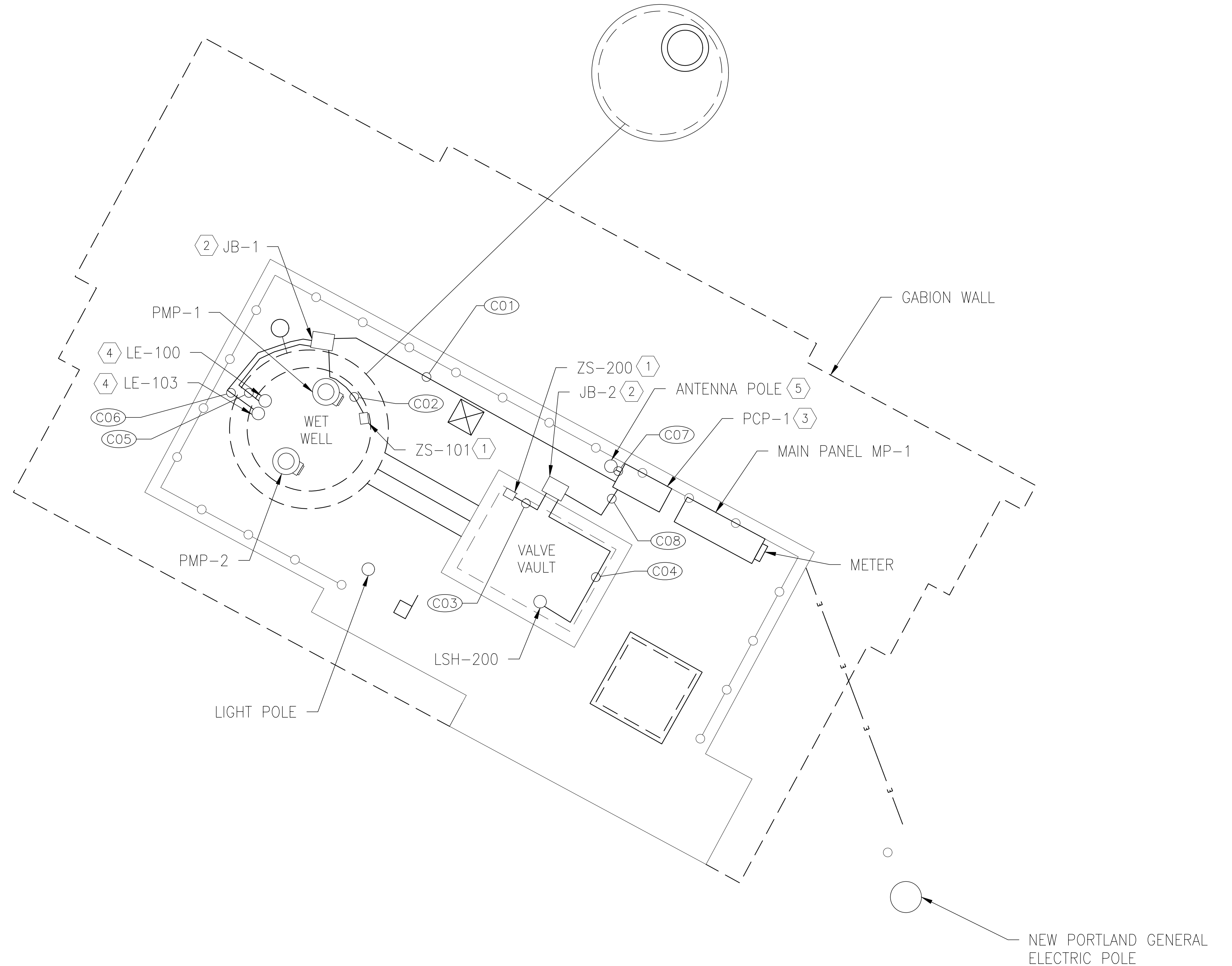
JOB NO. 201779
DRAWING NO. <b>E02</b>
SHEET NO. OF

SHEET NOTES:

1. ALL CONDUITS SHALL BE DIRECT BURIED. MINIMUM BURIAL DEPTH IS 24 INCHES.
2. CORE DRILL THE WET WELL AND VALVE VAULT FOR ENTRANCE OF CONDUITS. SEAL PENETRATIONS IN ACCORDANCE WITH TYPICAL DRAWING E004.
3. THE WET WELL INTERIOR IS A CLASS 1 DIVISION 1 LOCATION. THE VALVE VAULT INTERIOR IS A CLASS 1 DIVISION 2 LOCATION.
4. FOR ELECTRICAL ONE-LINE, SEE DWG. E03.
5. FOR CONDUIT/CONDUCTOR SCHEDULE, SEE DWG. E07.
6. INSTALL CONDUIT AND CONDUCTORS IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC) AND ANY APPLICABLE LOCAL CODES.

KEY NOTES:

- ① LOCATE LIMIT SWITCHES SO THEY DO NOT INTERFERE WITH ACCESS TO THE VAULTS OR EQUIPMENT REMOVAL.
- ② NEMA TYPE 4X JUNCTION BOX WITH TERMINALS FOR TRANSITIONING FROM THE PUMP POWER & CONTROL CABLES AND OTHER CONTROL CABLES TO THE PUMP CONTROL PANEL WIRES. MOUNT THE JUNCTION BOX ON THE SIDE OF THE WET WELL / VALVE VAULT SIMILAR TO TYPICAL DETAIL E007. PROVIDE CONDUIT SEALS PER TYPICAL DETAIL ONLY BETWEEN THE JUNCTION BOX AND THE WET WELL. PROVIDE PVC COATED STEEL CONDUIT SLEEVES FROM THE JUNCTION BOXES INTO THE WET WELL FOR THE PUMPS AND CONTROL INTEGRAL CABLES. LOCATE THE SLEEVES TO FACILITATE BOTH REMOVAL AND REINSTALLATION OF THE EQUIPMENT.
- ③ MOUNT PCP-1 SIMILAR TO TYPICAL DETAIL E007.
- ④ MOUNT LEVEL PROBES SIMILAR TO TYPICAL DETAIL E010.
- ⑤ MOUNT SCADA SYSTEM ANTENNA NEXT TO PCP-1 SIMILAR TO TYPICAL DETAIL E012.



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CHECKED		DESCRIPTION	
REV	DATE	BY	DESCRIPTION
0	2/19/23	EC	CREATED

DESIGNED	D. DELGADO
DRAWN	E. CHOW
CHECKED	
DATE	APRIL 2023



CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 CONTROL CONDUIT LAYOUT

VERIFY SCALES  
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JOB NO.	201779
DRAWING NO.	<b>E03</b>
SHEET NO.	OF



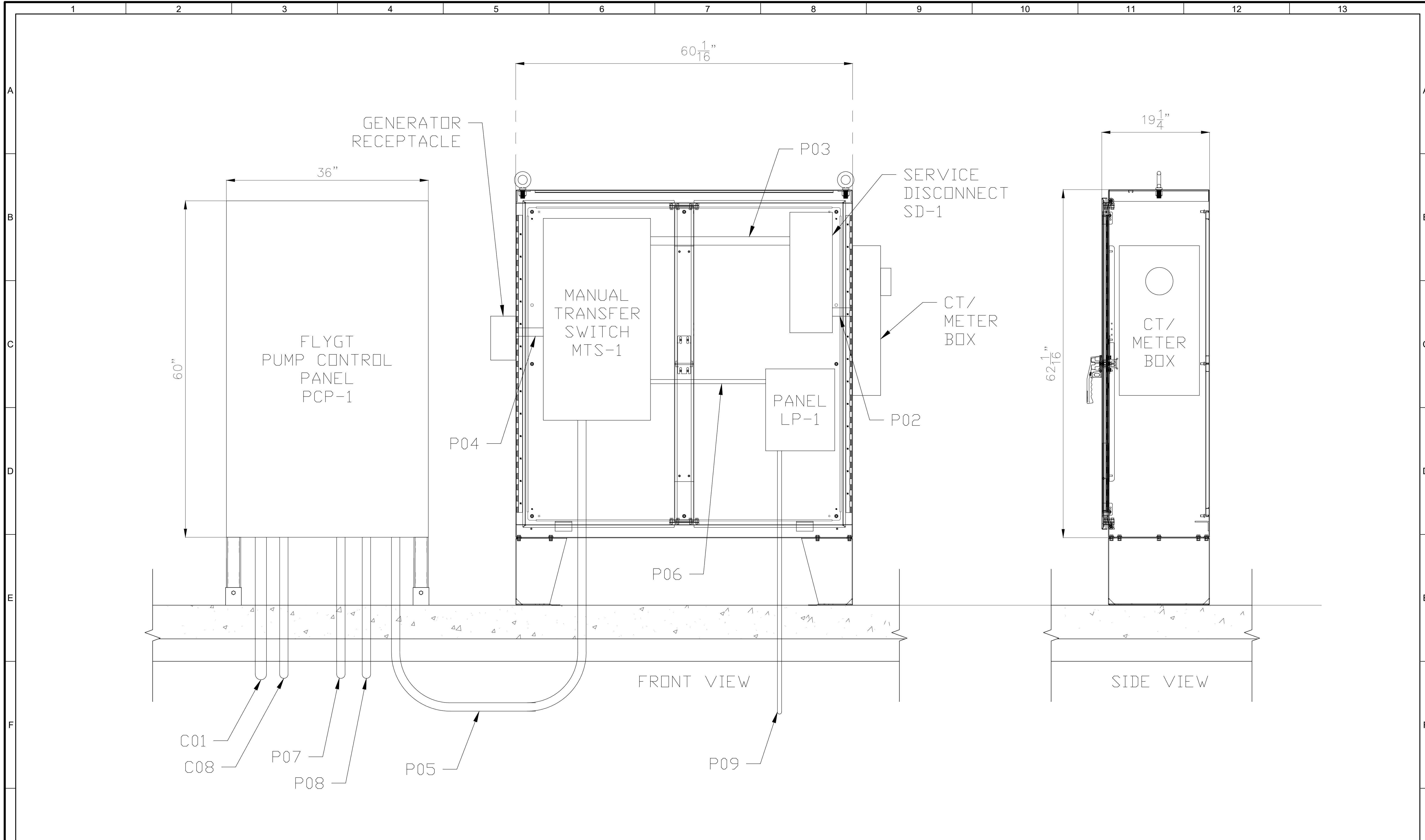
POWER CONDUIT / CONDUCTOR SCHEDULE													
CONDUIT ID No.	CONDUITS			CONDUCTORS PER CONDUIT							FROM	TO	NOTES
	QTY	SIZE	MATERIAL	POWER	NEUTRAL	GND	SPARE	MATERIAL	INSULATION	LENGTH			
P01	1	TBD	TBD	TBD	TBD	-		TBD	TBD	TBD	UTILITY TX	CT/METER BOX	UTILITY SERVICE
P02	1	1.25"	GRC	3-1 AWG	1-1 AWG	-		CU	XHHW-2	3'	CT/METER BOX	SD-1	1 SET OF THREE 1 AWG
P03	1	1.25"	GRC	3-1 AWG	1-1 AWG	-		CU	XHHW-2	3'	SD-1	MTS-1	1 SET OF THREE 1 AWG
P04	1	1.5"	GRC	3-1 AWG	1-1 AWG	1-8 AWG		CU	XHHW-2	3'	MTS-1	GEN RECEPTACLE	1 SET OF THREE 1 AWG
P05	1	1"	GRC	3-4 AWG	-	-		CU	XHHW-2	3'	MTS-1	PCP-1	1 SET OF THREE 4 AWG
P06	1	0.75"	GRC	2-8 AWG	1-8 AWG	1-8 AWG		CU	XHHW-2	3'	MTS-1	PANEL LP-1	1 SET OF THREE 8 AWG
P07	1	0.5"	GRC	3-10 AWG	-	1-10 AWG		CU	XHHW-2	TBD	PCP-1	JB-1	1 SET OF THREE 10 AWG
P08	1	0.5"	GRC	3-10 AWG	-	1-10 AWG		CU	XHHW-2	TBD	PCP-1	JB-1	1 SET OF THREE 10 AWG
P09	1	0.5"	GRC	2-14 AWG	-	1-14 AWG		CU	THHN	TBD	LP-1	LIGHT POLE	1 SET OF TWO 14 AWG
CBL1	1	N/A	N/A	N/A	1-CABLE	N/A		N/A	N/A	TBD	JB-1	PUMP 1	MANUFACTURER CABLE FOR PUMP 1.
CBL2	1	N/A	N/A	N/A	1-CABLE	N/A		N/A	N/A	TBD	JB-1	PUMP 2	MANUFACTURER CABLE FOR PUMP 2.
NOTES: 1. TBD = TO BE DETERMINED													

CONTROL CONDUIT / CONDUCTOR SCHEDULE													
CONDUIT ID No.	CONDUITS			CONDUCTORS PER CONDUIT							FROM	TO	NOTES
	QTY	SIZE	MATERIAL	CONTROL	CABLE	GND	SPARE	MATERIAL	INSULATION	LENGTH			
C01	1	2"	GRC	SEE NOTE	SEE NOTE	SEE NOTE	4-14 AWG	CU	XHHW-2	TBD	PCP-1	JB-1	CONTAINS C02, C03, C04, C05 & C06 CABLES + SPARE WIRES.
C02	1	0.75"	GRC	2-14 AWG		1-14 AWG		CU	XHHW-2	TBD	JB-1	ZS-101	MANUFACTURER CABLE FOR INTRUSION SWITCH IN WET WELL.
C03	1	0.75"	GRC	2-14 AWG		1-14 AWG		CU	XHHW-2	TBD	JB-1	ZS-200	MANUFACTURER CABLE FOR INTRUSION SWITCH IN VALVE VAULT.
C04	1	N/A	N/A	N/A	1-CABLE	N/A		N/A	N/A	TBD	JB-1	LSH-200	MANUFACTURER CABLE FOR FLOOD FLOAT IN VALVE VAULT.
C05	1	N/A	N/A	N/A	1-CABLE	N/A		N/A	N/A	TBD	JB-1	LEVEL PROBE LE-100	MANUFACTURER CABLE FOR HIGH LEVEL PROBE SENSOR.
C06	1	N/A	N/A	N/A	1-CABLE	N/A		N/A	N/A	TBD	JB-1	LEVEL PROBE LE-103	MANUFACTURER CABLE FOR LEVEL PROBE SENSORS.
C07	1	N/A	N/A	N/A	1-CABLE	N/A		N/A	N/A	TBD	PCP-1	ANTENNA POLE	MANUFACTURER CABLE FOR LTE ANTENNA FOR SCADA SYSTEM.
C08	1	1"	GRC	SEE NOTE	SEE NOTE	SEE NOTE	4-14 AWG	CU	XHHW-2	TBD	PCP-1	JB-2	CONTAINS C03 & C04 CABLES + SPARE WIRES.
NOTES: 1. TBD = TO BE DETERMINED													

SHEET NOTES:

- FOR ELECTRICAL ONE-LINE, SEE DWG. E07.
- FOR POWER CONDUIT LAYOUT, SEE DWG. E02.
- FOR CONTROL CONDUIT LAYOUT, SEE DWG. E03.
- INSTALL CONDUIT AND CONDUCTORS IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC) AND ANY APPLICABLE LOCAL CODES.

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				DRAWN E. CHOW				CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT					DRAWING NO. E04
0	2/19/23	EC	CREATED	DATE APRIL 2023	POWER & CONTROL				CONDUIT / CONDUCTOR SCHEDULE		IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. OF	



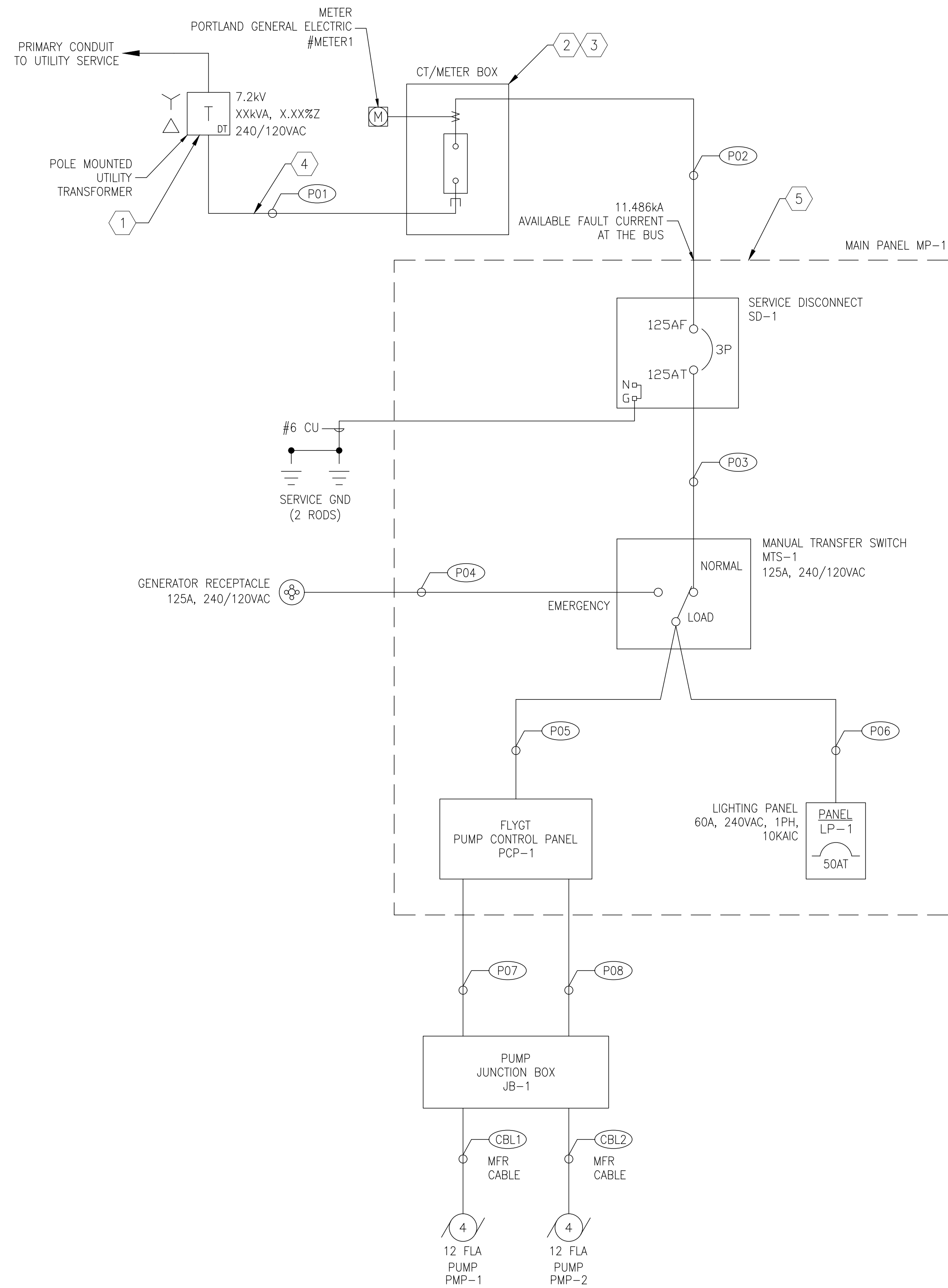
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0	2/19/23	EC	CREATED
REV	DATE	BY	DESCRIPTION






CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 MAIN PANEL MP-1 LAYOUT

VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. E05
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VOLTS =	240	/120	POWER DISTRIBUTION PANEL =	PANEL LP-1	MAIN =	50A MCB				
PHASE =	1		LOCATION =	INSIDE ENCLOSURE	MOUNTING =	SURFACE				
WIRES =	3		AIC =	10K						
DESCRIPTION	BKR	CKT	POLE	LOAD (VA)	PHASE	LOAD (VA)	POLE	CKT	BKR	DESCRIPTION
HEATER	20A	1	1	100	A	1000	1	2	20A	RECEPTACLES
UPS RECEPTACLE (FUTURE)	20A	3	1	1200	B	10	1	4	20A	PANEL LIGHT
OUTDOOR LIGHT	20A	5	1	250	A	250	1	6	20A	WET WELL LIGHT
SPARE	20A	7	1	0	B	0	1	8	20A	SPARE

PANEL LP-1 CONNECTED LOAD	
LOAD PER PHASE	A = 1600 VA
	B = 1210 VA
TOTAL LOAD (VA) =	2810 VA
TOTAL LOAD (W) =	2670 W
TOTAL LOAD AMPS (2810/240) =	11.7 A

\*Assumptions: PF=0.95

PANEL LP-1 LOAD			
PANEL LP-1 SPECIFICATIONS:	50A	120/240V	1-PHASE 3W 60HZ 10 KAIC
CONNECTED LOAD VA =	2810.0		
CONNECTED LOAD AMPS =	11.7		
MOTORS LOAD			
MOTORS	HP	FLA PER NEC 2023	
PUMP 1	10.0	28.0	
PUMP 2	10.0	28.0	
TOTAL MOTOR LOAD	20.0	56.0	
TOTAL LOAD			
EQUIPMENT	AMPS	KVA	
PANEL LP-1	11.7	2.81	
PANEL PCP-1 (MOTOR LOADS & CONTROL COMPONENTS)	68.0	28.23	
MAX TOTAL CONNECTED LOAD	79.7	31.04	
FORMULAS USED:			
1PH:	KVA = AMPS*VOLTS/1000		
3PH:	KVA = AMPS*(VOLTS*1.732)/1000		
CONNECTED KVA LOAD = SUM OF CONNECTED EQUIPMENT KVA			
ASSUMED PF = 0.8			

**SHEET NOTES:**

- INSTALL IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC) AND ANY APPLICABLE LOCAL CODES.
- ALL EQUIPMENT SHOULD BE UL LISTED.
- USE PVC CONDUIT FOR UNDERGROUND RUNS, AND GRC CONDUIT FOR ABOVE GROUND RUNS.
- FOR CONDUIT/CONDUCTOR SCHEDULE, SEE DWG. E07.

**KEY NOTES:**

- TRANSFORMER WITH 240/120VAC SECONDARY IS PROVIDED BY PORTLAND GENERAL ELECTRIC (PGE).
- THE CONTRACTOR SHALL FURNISH AND INSTALL THE UTILITY METER SOCKET IN ACCORDANCE WITH ALL PGE STANDARDS AND PROVIDE GROUNDING PER UTILITY STANDARDS.
- UTILITY METER IS FURNISHED BY PGE.
- INSTALL A FLAT PULL LINE CAPABLE OF 1000 POUNDS OF TENSION MINIMUM. PROVIDE AT LEAST 72" OF EXTRA LINE AT BOTH ENDS OF THE CONDUIT.
- THE POWER AND CONTROL ENCLOSURE ONE-LINE SHOWS ALL THE MAJOR PANEL COMPONENTS. REFER TO THE ELECTRICAL/INSTRUMENTATION DRAWINGS FOR DETAIL (TBD).

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DRAWN	E. CHOW
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DATE	APRIL 2023




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CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 ONE-LINE DIAGRAM

VERIFY SCALES	JOB NO.
BAR IS ONE INCH ON ORIGINAL DRAWING	201779
0  1"	DRAWING NO.
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	<b>E07</b>
	SHEET NO.
	OF

PROCESS & INSTRUMENTATION DRAWING INDEX			
SHEET	DWG NO.	TITLE	COMMENTS
23	N01	PROCESS & INSTRUMENTATION DRAWING INDEX	-
24	N02	PROCESS & INSTRUMENTATION LEGEND & SYMBOLS	-
25	N03	-	-
26	N04	-	-
27	N05	-	-
28	N06	WET WELL PROCESS & INSTRUMENTATION DIAGRAM	-
29	N07	VALVE VAULT PROCESS & INSTRUMENTATION DIAGRAM	-
30	N08	-	-
31	N09	-	-
32	N10	-	-
33	N11	-	-
34	N12	PCP-1 ENCLOSURE LAYOUT	-
35	N13	PCP-1 PANEL LAYOUT	-
36	N14	PCP-1 TERMINAL BLOCKS	-
37	N15	PCP-1 BOM	-
38	N16	PCP-1 POWER SCHEMATIC	-
39	N17	PCP-1 CONTROL DRAWING PAGE 1	-
40	N18	PCP-1 MULTISMART INPUTS	-
41	N19	PCP-1 MULTISMART OUTPUTS	-
42	N20	PCP-1 CONTROL DRAWING PAGE 2	-
43	N21	PCP-1 INTRINSICALLY SAFE CONTROL DRAWING	-
44	N22	PCP-1 SCADA SYSTEM	-
45	N23	TYPICAL DETAILS PAGE 1	-
46	N24	TYPICAL DETAILS PAGE 2	-

A

B

C

D

E

F

G

A

B

C

D

E

F

G

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CITY OF WEST LINN CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT PROCESS & INSTRUMENTATION DRAWING INDEX
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VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY
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JOB NO. 201779
DRAWING NO. N01
SHEET NO. OF

1 2 3 4 5 6 7 8 9 10 11 12 13

1 2 3 4 5 6 7 8 9 10 11 12 13

INSTRUMENT IDENTIFICATION TAG LETTERS

ID	FIRST LETTER		SUCCEEDING LETTER(S)		
	MEASURED or INITIATING VARIABLE	MODIFIER	READOUT or PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY (ELECTRICAL)			CONTROLLER	
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW	RATIO			
G	GAUGING (DIMENSIONAL)		GLASS		
H	HAND (MANUALLY INITIATED)				HIGH and HIGH-HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME or TIME SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW and LOW-LOW
M	MOISTURE or HUMIDITY				MID./ INTERMEDIATE
N	TORQUE		ISOLATOR		
O	USER'S CHOICE		ORIFICE		
P	PRESSURE or PNEUMATIC		POINT		
Q	QUANTITY	INTEGRATE TOTALIZE			
R	RADIOACTIVITY		RECORD or PRINT		
S	SPEED or FREQUENCY			SWITCH	
T	TEMPERATURE			TRANSMITTER	
U	MULTI-VARIABLE		MULTI-FUNCTION	MULTI-FUNCTION	MULTI-FUNCTION
V	VISCOSITY			VALVE DAMP./ LOUVER	
W	WEIGHT or FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE or PRESENCE			RELAY or COMPUTE	
Z	POSITION				

PROCESS & INSTRUMENTATION INDICATORS

SYMBOL	DESCRIPTION
	PANEL FRONT MOUNTED INDICATING LIGHT
	PANEL FRONT MOUNTED OPERATOR DEVICE

PROCESS & INSTRUMENTATION VALVES & GAUGES

SYMBOL	DESCRIPTION
	GATE VALVE
	SWING CHECK VALVE
	PLUG
	PRESSURE GAUGE

PROCESS & INSTRUMENTATION LOGIC

SYMBOL	DESCRIPTION
	CONTROL LOGIC GENERALIZED TO REPRESENT PLC and/or HARDWIRED RELAY LOGIC
	CONTROL LOGIC WITH DIGITAL and/or ANALOG SIGNAL INPUTS
	CONTROL LOGIC WITH DIGITAL and/or ANALOG SIGNAL OUTPUTS
	CONTROL FUNCTION RESIDENT IN DCS OR OIT (MMI) DEVICES

PROCESS & INSTRUMENTATION PUMPS

SYMBOL	DESCRIPTION
	SUBMERSIBLE PUMP AND MOTOR

PROCESS & INSTRUMENTATION TRANSMITTERS

SYMBOL	DESCRIPTION
	LEVEL FLOAT SWITCH
	LEVEL PROBE

PROCESS & INSTRUMENTATION LINE & INTERFACE LEGEND

SYMBOL	DESCRIPTION
	PLC/DCS PROGRAM LOGIC (SOFTWARE)
	ELECTRICAL SIGNAL
	PRIMARY PROCESS FLOW IN PIPE
	PROCESS ENTRY/EXIT POINTS
	INTERFACE TO OR FROM PROCESS EXTERNAL TO PROJECT

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DESIGNED  
F. DELGADO  
DRAWN  
E. CHOW  
CHECKED

DATE  
APRIL 2023

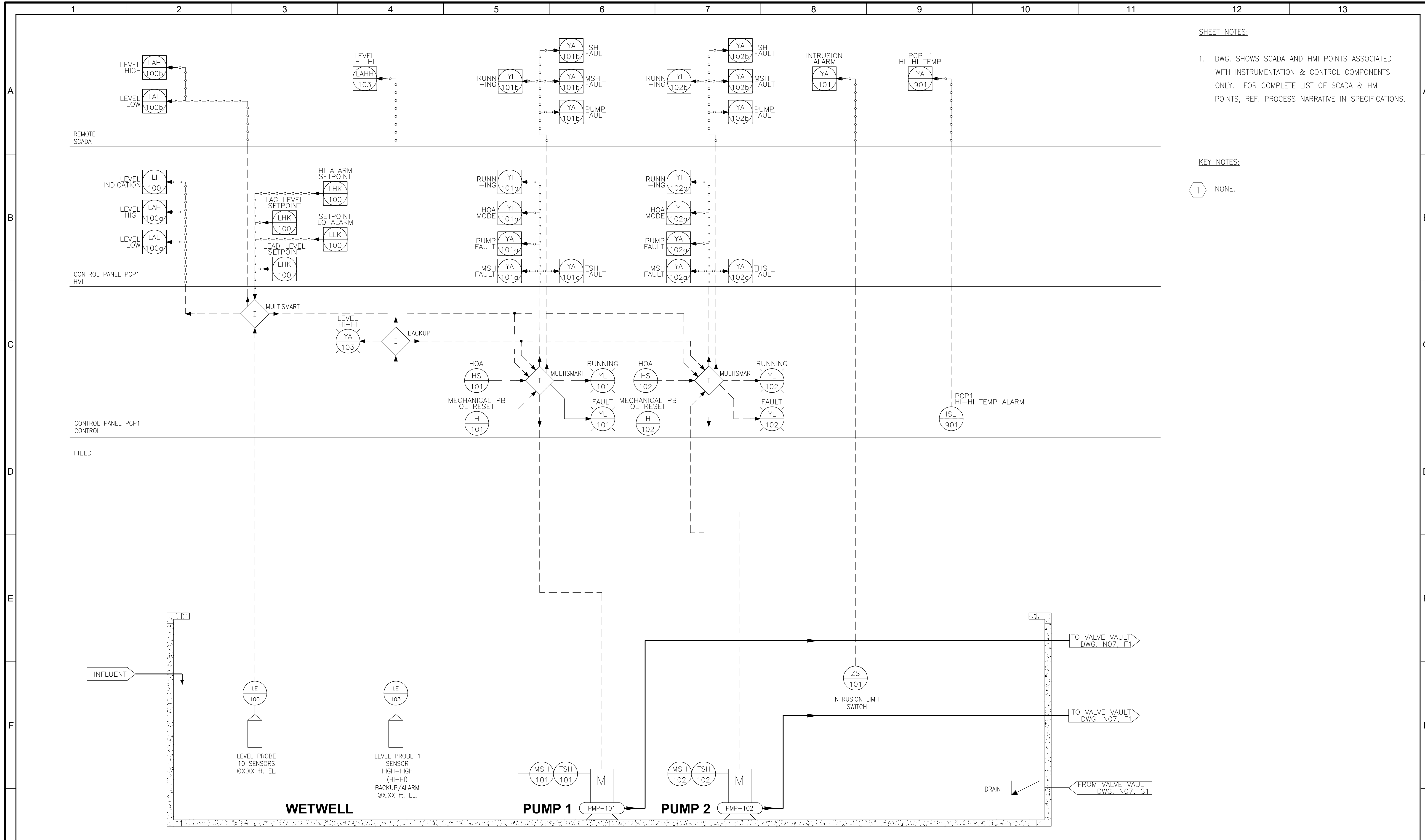
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0	2/19/23	EC	CREATED



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
PROCESS & INSTRUMENTATION  
LEGEND & SYMBOLS

VERIFY SCALES  
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JOB NO.  
201779  
DRAWING NO.  
**N02**  
SHEET NO.  
OF



**SHEET NOTES:**

- DWG. SHOWS SCADA AND HMI POINTS ASSOCIATED WITH INSTRUMENTATION & CONTROL COMPONENTS ONLY. FOR COMPLETE LIST OF SCADA & HMI POINTS, REF. PROCESS NARRATIVE IN SPECIFICATIONS.

**KEY NOTES:**

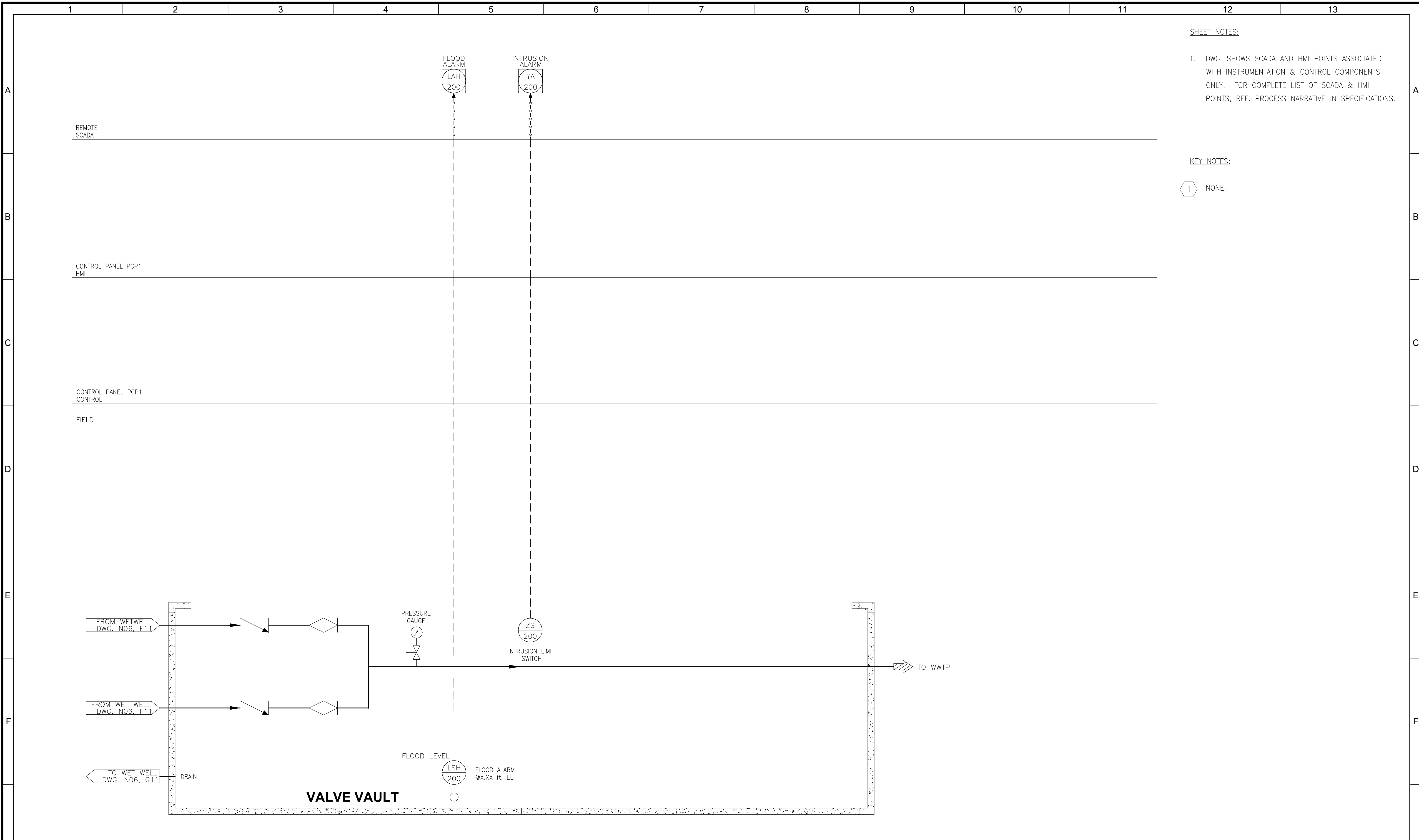
1 NONE.

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DRAWN	F. DELGADO
CHECKED	
DATE	APRIL 2023

CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 WET WELL  
 PROCESS & INSTRUMENTATION DIAGRAM

VERIFY SCALES	JOB NO.	201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO.	N06
0 1"	SHEET NO.	OF
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY		



SHEET NOTES:

- DWG. SHOWS SCADA AND HMI POINTS ASSOCIATED WITH INSTRUMENTATION & CONTROL COMPONENTS ONLY. FOR COMPLETE LIST OF SCADA & HMI POINTS, REF. PROCESS NARRATIVE IN SPECIFICATIONS.

KEY NOTES:

1 NONE.

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED F. DELGADO	DRAWN F. DELGADO	CHECKED	DATE APRIL 2023
0	2/19/23	EC	CREATED
REV	DATE	BY	DESCRIPTION

DESIGNED  
F. DELGADO

DRAWN  
F. DELGADO

CHECKED

DATE  
APRIL 2023




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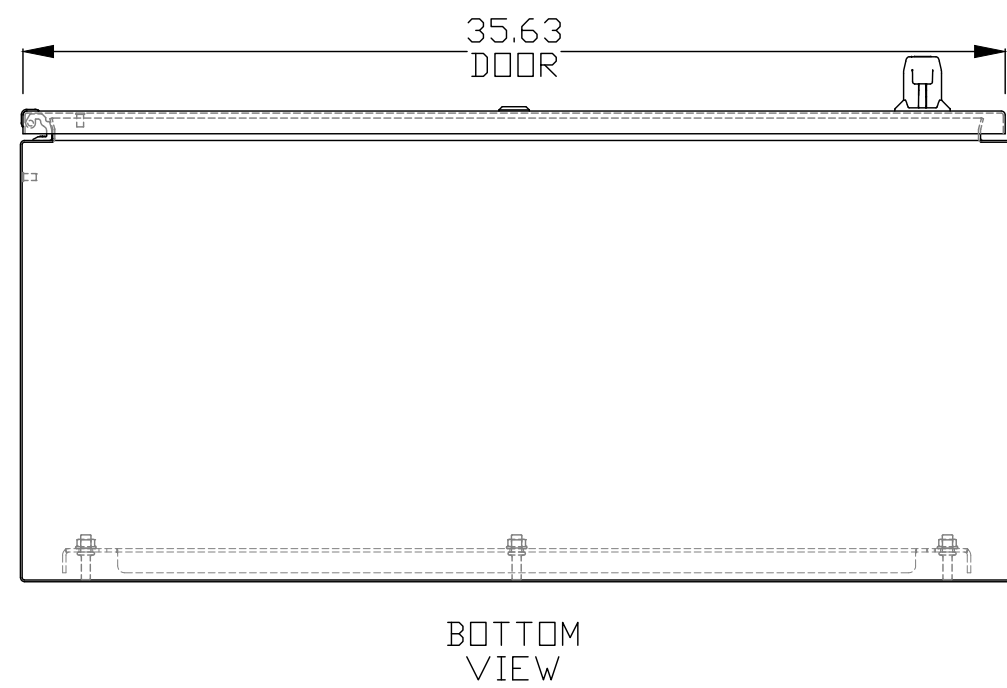
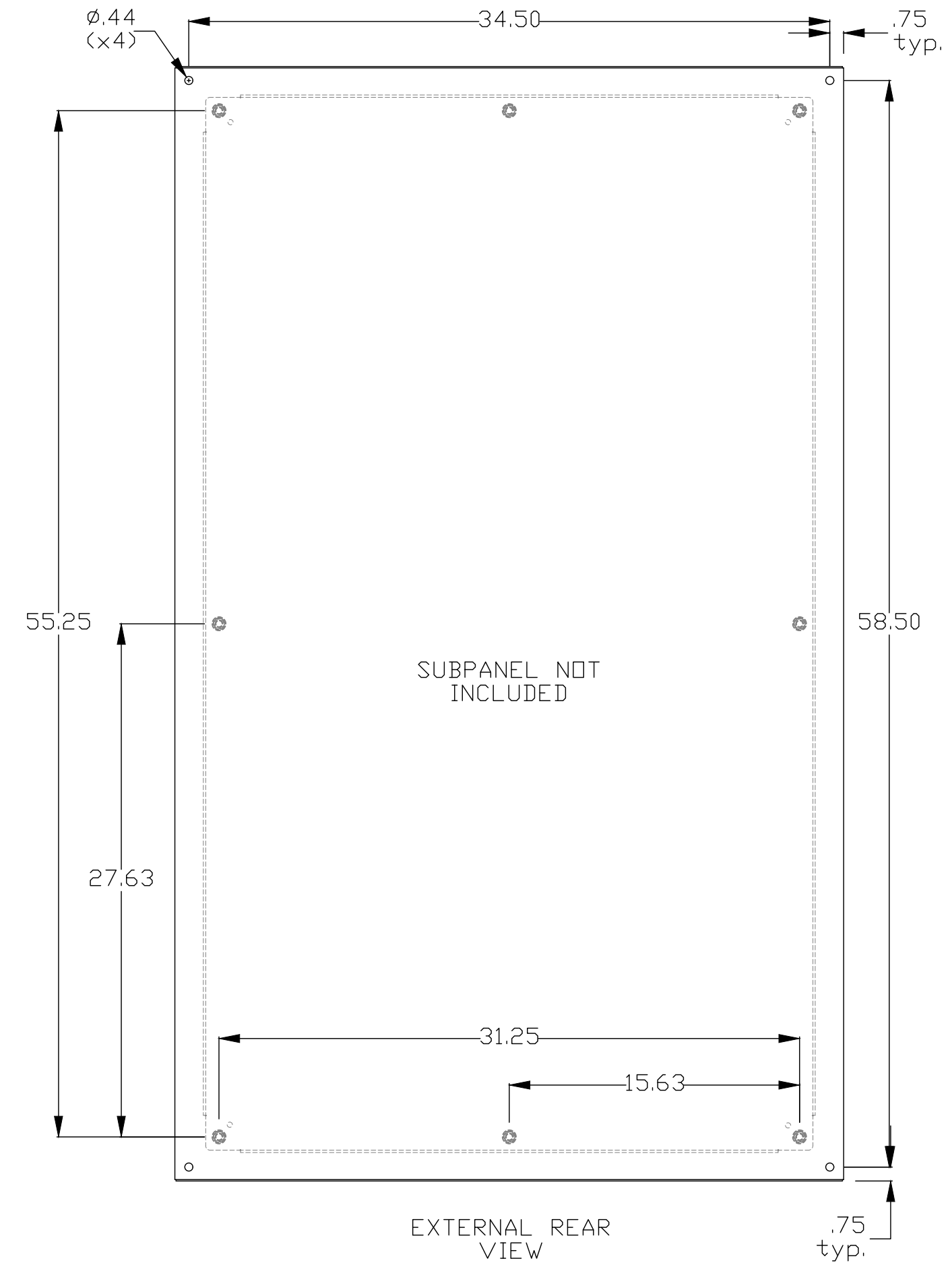
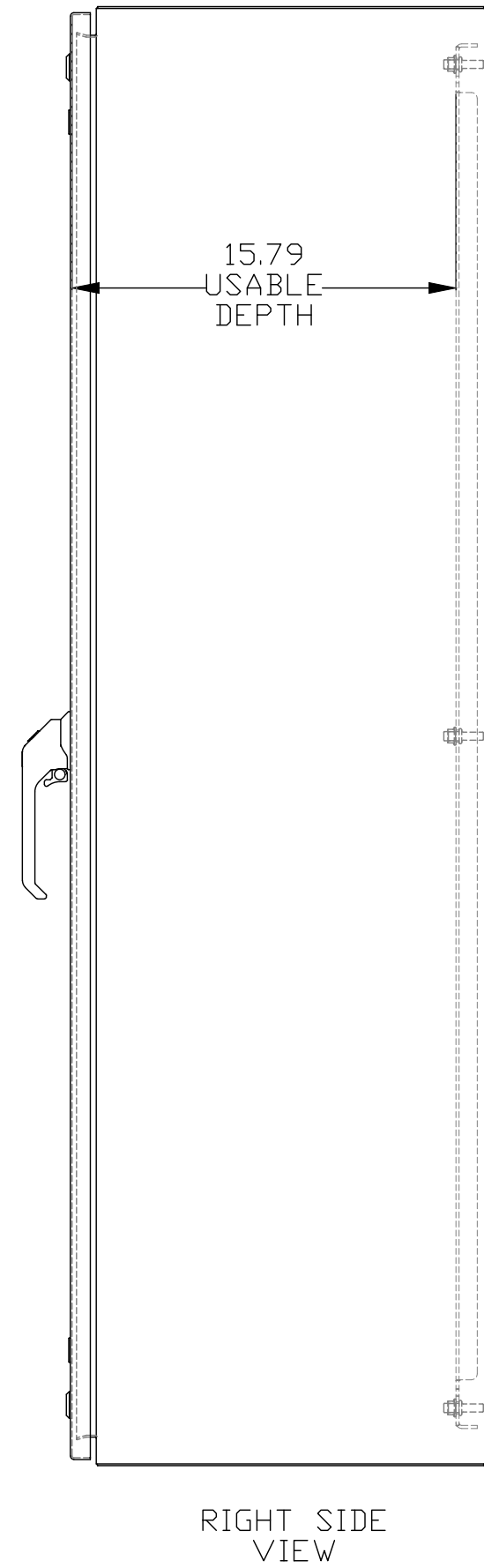
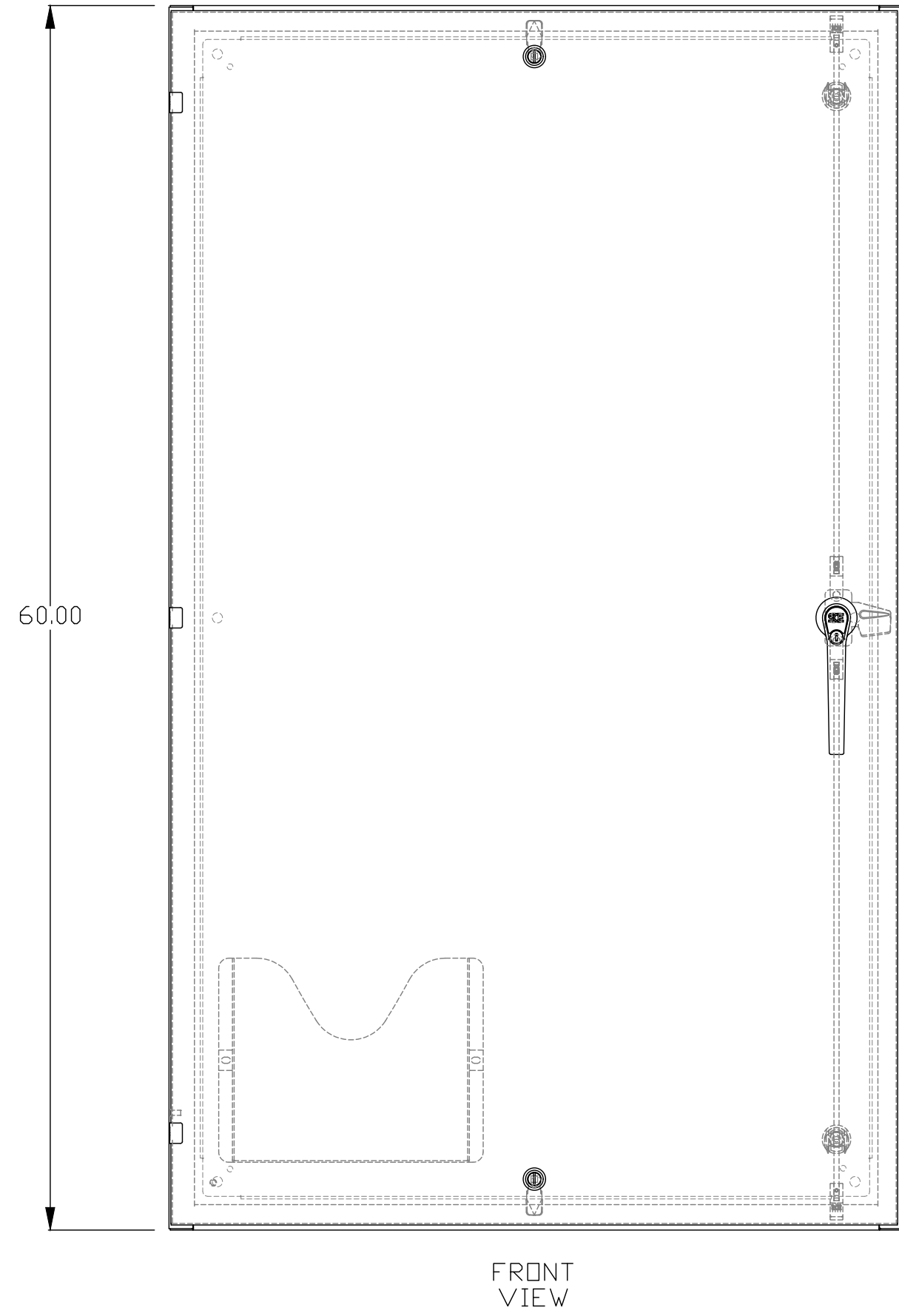
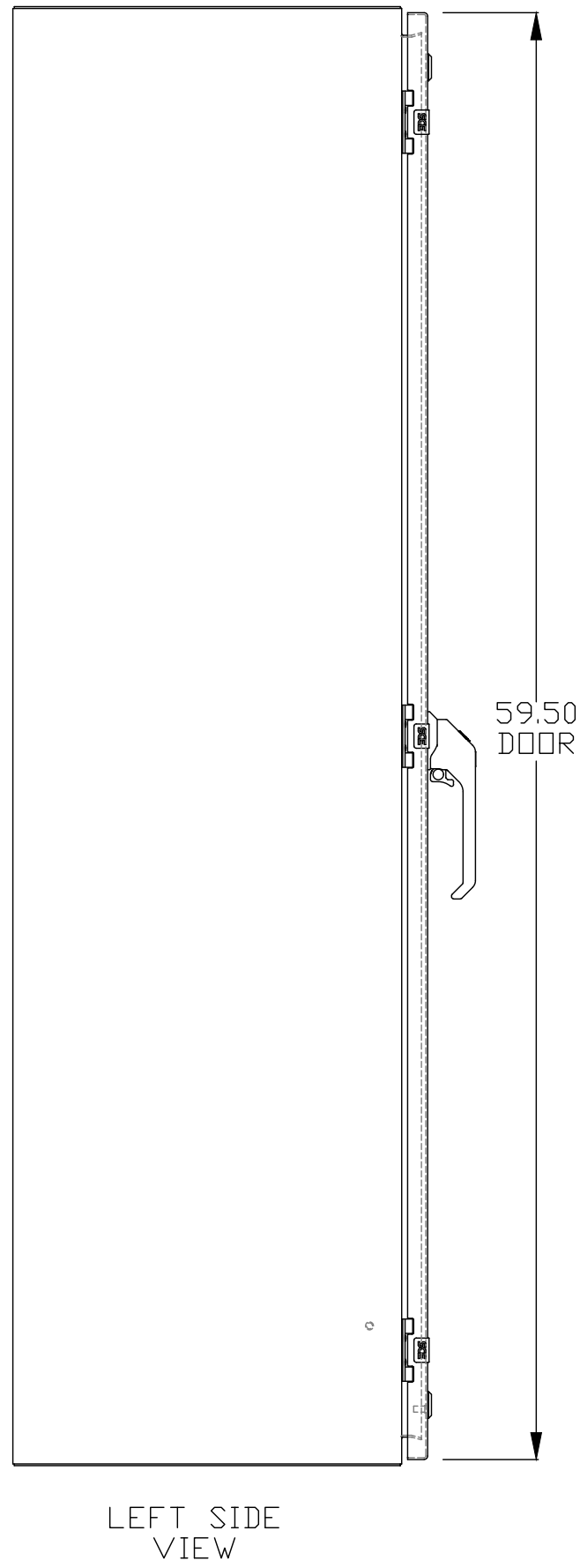
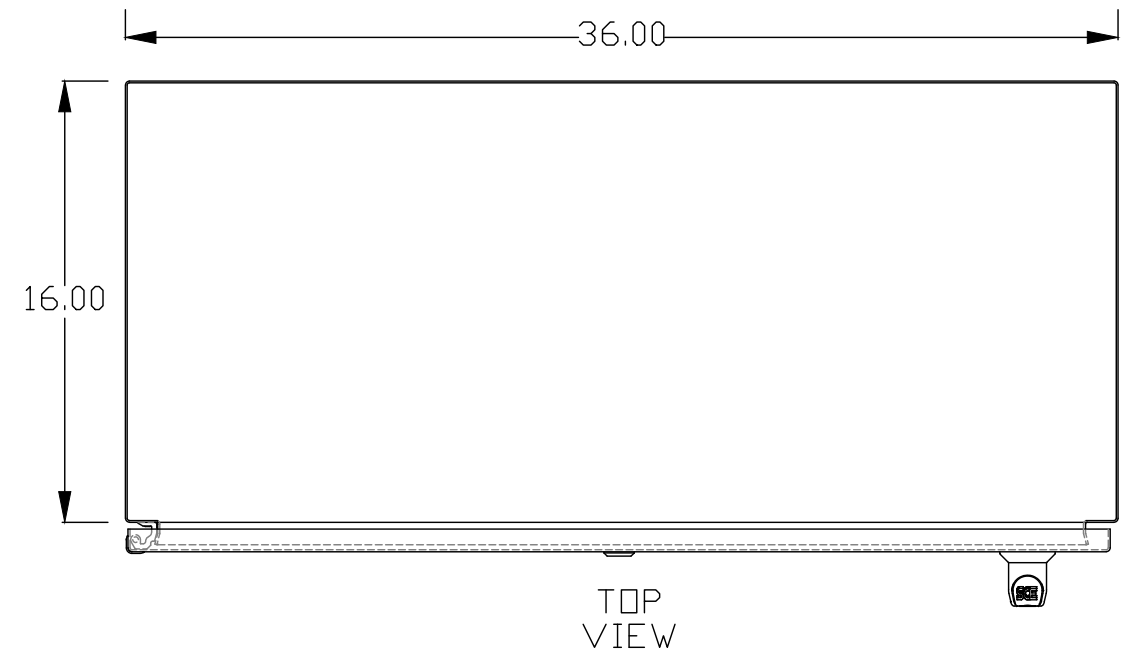




CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 VALVE VAULT  
 PROCESS & INSTRUMENTATION DIAGRAM

VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. <b>N07</b>
0  1"	SHEET NO. OF
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

SAGINAW CONTROL &  
ENGINEERING  
SCE-60EL3616SSLPPL



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CHECKED			
DATE	APRIL 2023		
REV	DATE	BY	DESCRIPTION
0	2/19/23	EC	CREATED

DESIGNED	F. DELGADO
DRAWN	E. CHOW
CHECKED	
DATE	APRIL 2023



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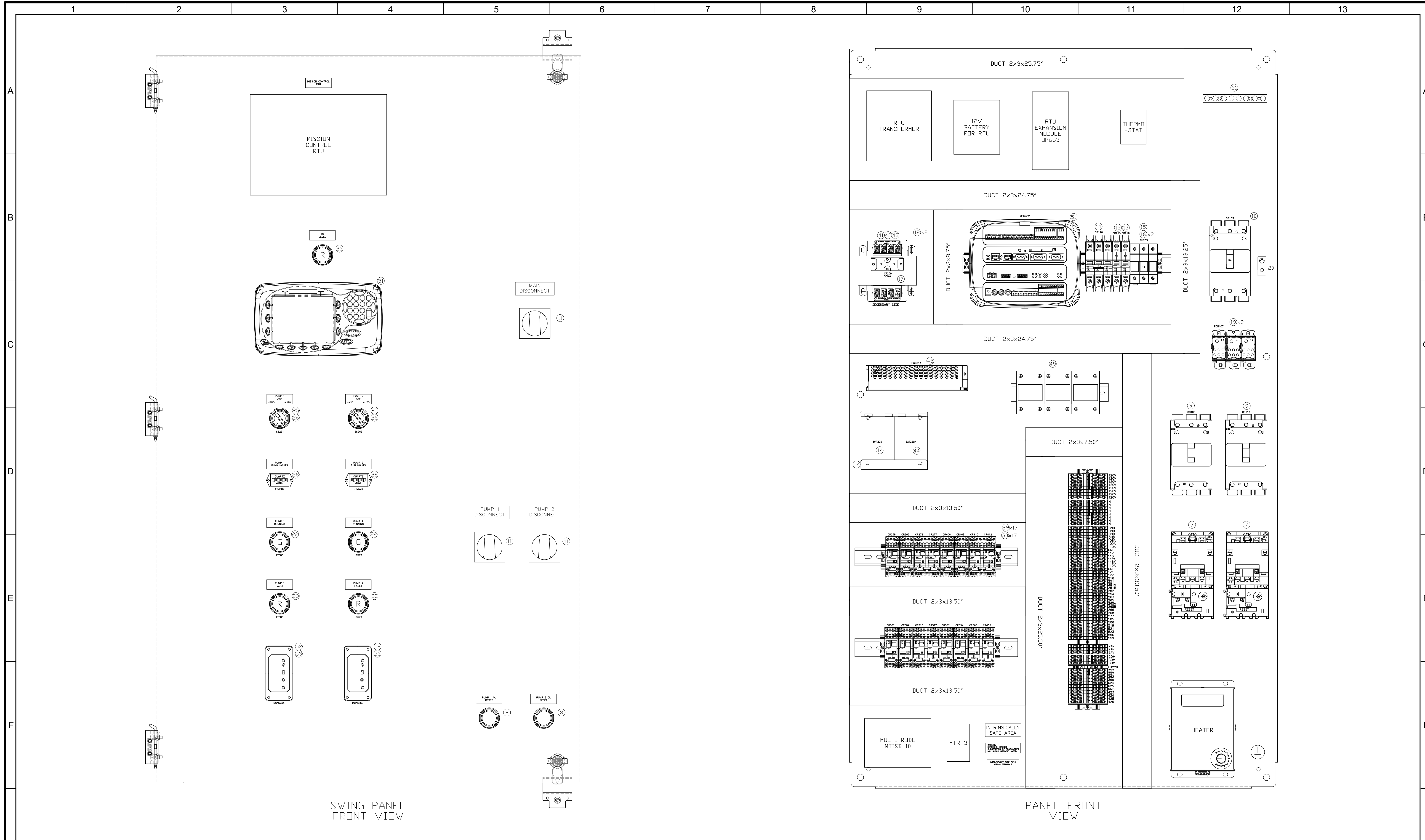




CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
PROCESS & INSTRUMENTATION DRAWING  
PCP-1 ENCLOSURE

VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. <b>N12</b>
0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. OF





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0	2/19/23	EC	CREATED
REV	DATE	BY	DESCRIPTION

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DRAWN E. CHOW
CHECKED
DATE APRIL 2023



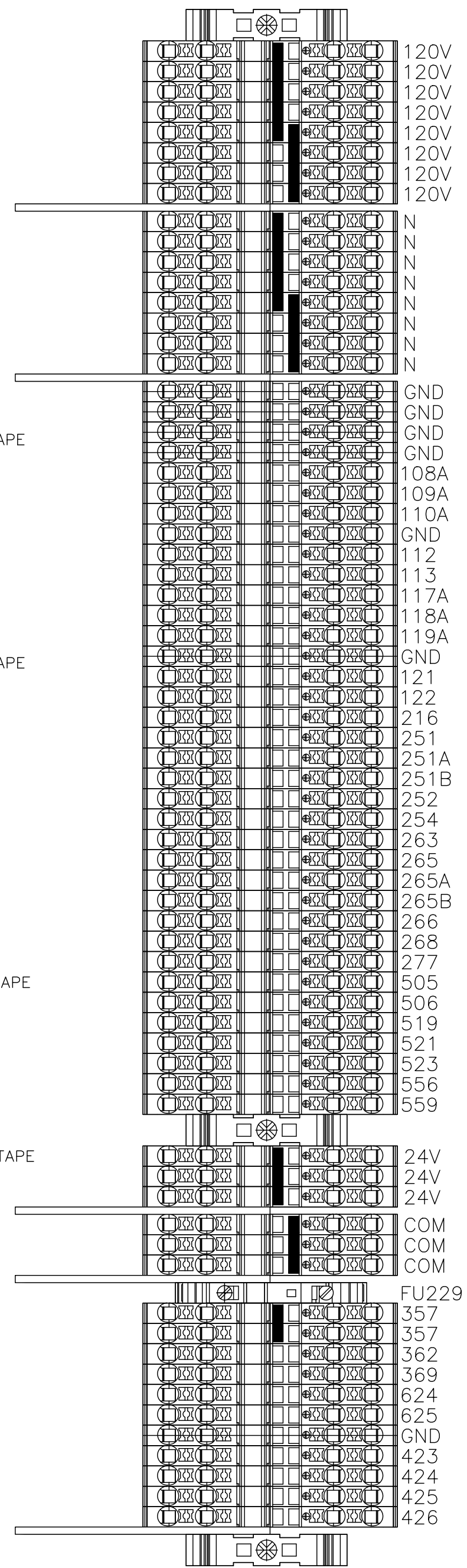
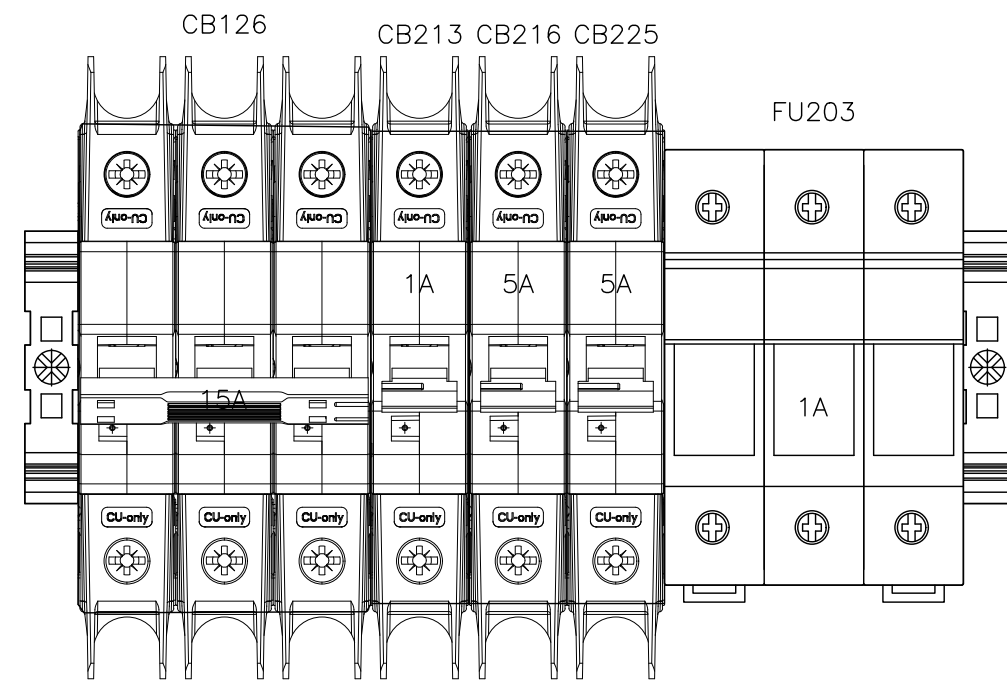
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CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 PROCESS & INSTRUMENTATION DRAWING  
**PCP-1 FRONT AND SUB PANEL LAYOUT**

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201779 DRAWING NO. <b>N13</b> SHEET NO. OF
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**WARNING**  
EXPLOSION HAZARD. TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTIBLE ATMOSPHERES, DISCONNECT POWER BEFORE SERVICING

PROVIDES INTRINSICALLY SAFE CIRCUIT EXTENSIONS FOR USE IN CLASS I GROUPS A,B,C,D HAZARDOUS LOCATIONS WHEN CONNECTED PER CONTROL DRAWING NO.16018

**WARNING**  
EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY

INTRINSICALLY SAFE FIELD WIRING TERMINALS

PLACARDS TYP. x2  
DIMENSIONS 1x5"  
BLACK W/WHITE TEXT  
TEXT HEIGHT 0.125"  
AFFIXED W/ DOUBLE SIDED TAPE

PLACARD  
DIMENSIONS 0.75x2.75"  
BLACK W/WHITE TEXT  
TEXT HEIGHT 0.1"  
AFFIXED W/ DOUBLE SIDED TAPE

PLACARD  
DIMENSIONS 0.5x2.75"  
BLACK W/WHITE TEXT  
TEXT HEIGHT 0.1"  
AFFIXED W/ DOUBLE SIDED TAPE

INTRINSICALLY SAFE CIRCUITS

INTRINSICALLY SAFE CIRCUITS

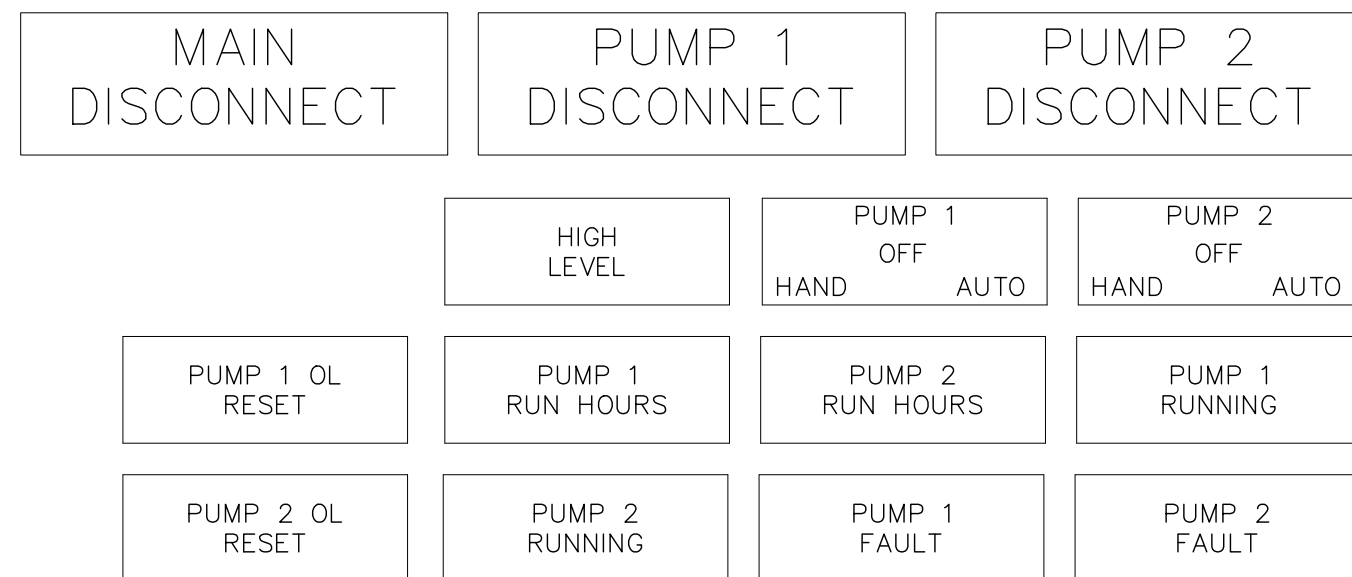
INTRINSICALLY SAFE AREA

PLACARDS TYP. x2  
DIMENSIONS 1x3"  
BLACK W/WHITE TEXT  
TEXT HEIGHT 0.20"  
AFFIXED W/ DOUBLE SIDED TAPE

PLACARDS TYP. x3  
DIMENSIONS 1x3"  
BLACK W/WHITE TEXT  
TEXT HEIGHT 0.25"  
AFFIXED W/ DOUBLE SIDED TAPE

PLACARDS TYP. x3  
DIMENSIONS 0.75x2"  
BLACK W/WHITE TEXT  
TEXT HEIGHT 0.125"  
AFFIXED W/ DOUBLE SIDED TAPE

PLACARDS TYP. x11  
DIMENSIONS 1x3"  
BLACK W/WHITE TEXT  
TEXT HEIGHT 0.25"  
AFFIXED W/ DOUBLE SIDED TAPE



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0	2/19/23	EC	CREATED
REV	DATE	BY	DESCRIPTION

DESIGNED  
F. DELGADO

DRAWN  
E. CHOW

CHECKED

DATE  
APRIL 2023

CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT

PROCESS & INSTRUMENTATION  
PCP-1 TERMINAL BLOCK DETAIL

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"	JOB NO. 201779
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	DRAWING NO. N14
	SHEET NO. OF

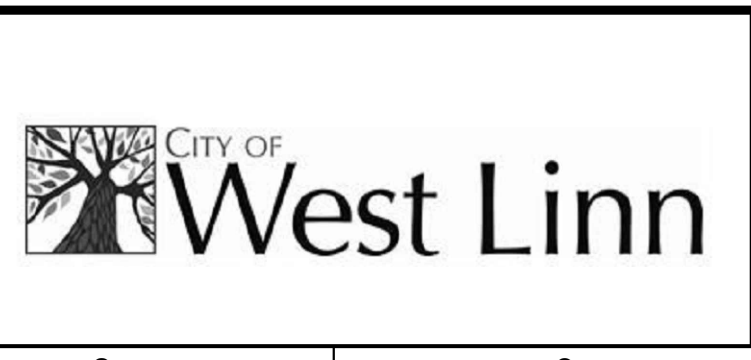
ITEM #	TAG	QTY	DESCRIPTION	MANUFACTURER	PART NUMBER
1	ENCLOSURE	1	48 X 36 X 16 NEMA 4X 304SS ENCLOSURE	SAGINAW	SCE-48EL3616SSLPPL
2	BACK PANEL	1	48 X 36 BACK PANEL WHITE	SAGINAW	SCE-48P36
3	DEADFRONT	1	DEADFRONT KIT FOR 48 X 36 ENCLOSURE	SAGINAW	SCE-DF48EL36LP
4	DRAIN	1	ENCLOSURE DRAIN, TYPE 3R/4/4X	SAGINAW	SCE-BVKD
5	M251, M256	2	CONTACTOR, NEMA 1 STARTER W/ SOLID STATE OVERLOAD, 120V COIL, OL 3-9A	SCHNEIDER	8536SCO3V02H309S
6	M251, M256	2	NO AUX CONTACT, FOR TYPE S CONTACTOR	SCHNEIDER	9999SX6
7	OL251,OL256	2	AUX CONTACT, FOR OL TRIP INDICATION	SCHNEIDER	9999AC04
8	OL251,OL256	2	OVERLOAD RESET PB THROUGH THE DOOR FOR NEMA OL	SCHNEIDER	9066RA1
9	CB108,CB117	2	15A molded circuit breaker, 3P	SCHNEIDER	BDL36015
10	CB103	1	30A molded circuit breaker, 3P	SCHNEIDER	BDL36030
11	HANDLE	3	Extended rotary handle red IP 54, B FRAME	SCHNEIDER	LV426933
12	CB213	1	1A, 1P, 277VAC, 48VDC MINI BREAKER, UL489	Allen Bradley	1489-M1C010
13	CB216	1	5A, 1P, 277VAC, 48VDC MINI BREAKER, UL489	Allen Bradley	1489-M1C050
14	CB126	1	15A, 3P, 277VAC, 48VDC MINI BREAKER, UL489	Allen Bradley	1489-M3C150
15	FB203	1	CLASS CC 3 POLE FUSE HOLDER	Littelfuse	LPSM003
16	FU203	3	1A CLASS CC	Littelfuse	KLDR001
17	FU210	1	3A, FLM series, Midget 10x38mm Fuse	Littelfuse	FLM003
18	FU207	2	3A CLASS CC	Littelfuse	KLDR003
19	PDB107	3	ERICO 150A 1 POLE DIST. BLK. - 569020	Erico	UDJ125A
20	GND LUG	1	ILSCO UL467 GROUND TERMINAL	ILSCO	TA-2/0
21	GND BAR	1	GROUND BAR	PANDUIT	UGB 2/0-414-6
22	LTxx	2	PILOT LIGHT GREEN, PTT, 12-130VAC/VDC	Allen Bradley	800HC-QRTH2G
23	LTxx	3	PILOT LIGHT RED, PTT, 12-130VAC/VDC	Allen Bradley	800HC-QRTH2R
24			NOT USED		
25	SS251,SS265	2	SELECTOR SWITCH, 3 POS, M-M-M, X-X-X	Allen Bradley	800HC-JR2KC1B
26	SS251,SS265	2	1 NO CONTACT BLOCK	Allen Bradley	800TC-XD1
27			NOT USED		
28	ETM502,ETM576	2	HOUR METER; QUARTZ, 2 HOLE RECTANGULAR, 120/240VAC, TYPE 4X WITH GASKET	TRUMETER	722-0001
29	CRxx	16	RELAY, 4PDT, 8A, LED, PTT, 120VAC COIL	SCHNEIDER	RXM4AB2F7
30	CRxx	16	RELAY, 4P SOCKET, DIN, BOX LUG	SCHNEIDER	RXZE2M114M
31	TERM	18	PT 4 Push-in Terminal Block, 6.2mm width, AWG: 24 - 10, 32A Feed-Through, Single Level, 1 point on each side	Phoenix Contact	3211757
32	TERM	1	PT 4-PE Push-in Terminal Block, 6.2mm width, AWG: 24 - 10, GND Block, Single Level, 1 point on each side	Phoenix Contact	3211766
33	TERM	2	PT 4 End cover, gray, 1 point each side	Phoenix Contact	3030420
34	TERM	67	PT 4-QUATTRO Push-in Terminal Blocks, 6.2mm width, AWG: 24 - 10, 32A Feed-Through, Single Level, 2 Points	Phoenix Contact	3211797
35	TERM	6	PT 4- QUATTRO PE Push-in Terminal Blocks, 6.2mm width, AWG: 24 - 10, GND block, Single Level, 2 Points	Phoenix Contact	3211809
36	TERM	5	PT 4 End Cover, Gray 2 points on one side, 2 points on other side	Phoenix Contact	3208979
37	TERM	17	PT End Stop	Phoenix Contact	800886
38	TERM	2	PT 4 Center Jumper, 3 Pole, Red FBS 2-6	Phoenix Contact	3030242
39	TERM	2	PT 4 Center Jumper, 4 Pole, Red, FBS 4-6	Phoenix Contact	3030255
40	TERM	2	PT 4 Center Jumper, 5 Pole, Red, FBS 5-6	Phoenix Contact	3030349
41	XF209	1	Transformer, 500VA, 220/230/240x440/460/480 -110/15/120	EATON	C0500E2A
42	XF209	1	PRIMARY FINGER SAFE COVERS	EATON	FSKFB
43	XF209	1	FINGER SAFE TERMINAL COVERS	EATON	FSK4
44	BAT229,BAT229A	2	BATTERY, LEAD CALCIUM, 12 VOLT, 7.20AH, RECHARGEABLE	POWER SONIC	PS1270 F1
45	PWS227	1	5A 24VDC POWER SUPPLY WITH UPS FUNCTION 120VAC INPUT/24VDC OUT, W/ BATTERY TERMINALS	Meanwell	AD-155B
46			NOT USED		
47	ISB622	1	INTRINSICALLY SAFE BARRIER, ANALOG, ONE CHANNEL, ISOLATED,24-230VAC/DC	PR ELECTRONICS	5104B-B2A
48	ISB602	1	INTRINSICALLY SAFE RELAY, TWO CHANNEL, ISOLATED,24-230VAC/DC	PR ELECTRONICS	5202B4
49	SPD126	1	SURGE PROTECT PRO, 480V, 3P	Flygt	14-400255
50			NOT USED		
51	MSM302	1	MULTISMART 3PC2	Flygt	84-800085
52	MCAS255,MCAS269	2	MINI-CAS RELAY	FLYGT	14-407129
53	MCAS255,MCAS269	2	MINI-CAS 11 PIN SOCKET	FLYGT	14-407130
54	BRACKET	1	BATTERY BRACKET	WIT	15733
55			NOT USED		
56	FU229	1	UT4-HESILED (5X20) FUSE HOLDER (*50 min), 24VDC LED INDICATION	Phoenix Contact	3046090
57	FU229	1	5X20 5A FUSE, AC/DC RATED, FAST ACTING	Littelfuse	0217005.MXP
58	TR515	1	1 POLE TIME DELAY RELAY, 24..240V AC/DC COIL, MULTI FUNCTION	Finder	83.01.0240.0000

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DESIGNED	F. DELGADO
DRAWN	E. CHOW
CHECKED	
DATE	APRIL 2023

0	2/19/23	EC	CREATED
REV	DATE	BY	DESCRIPTION

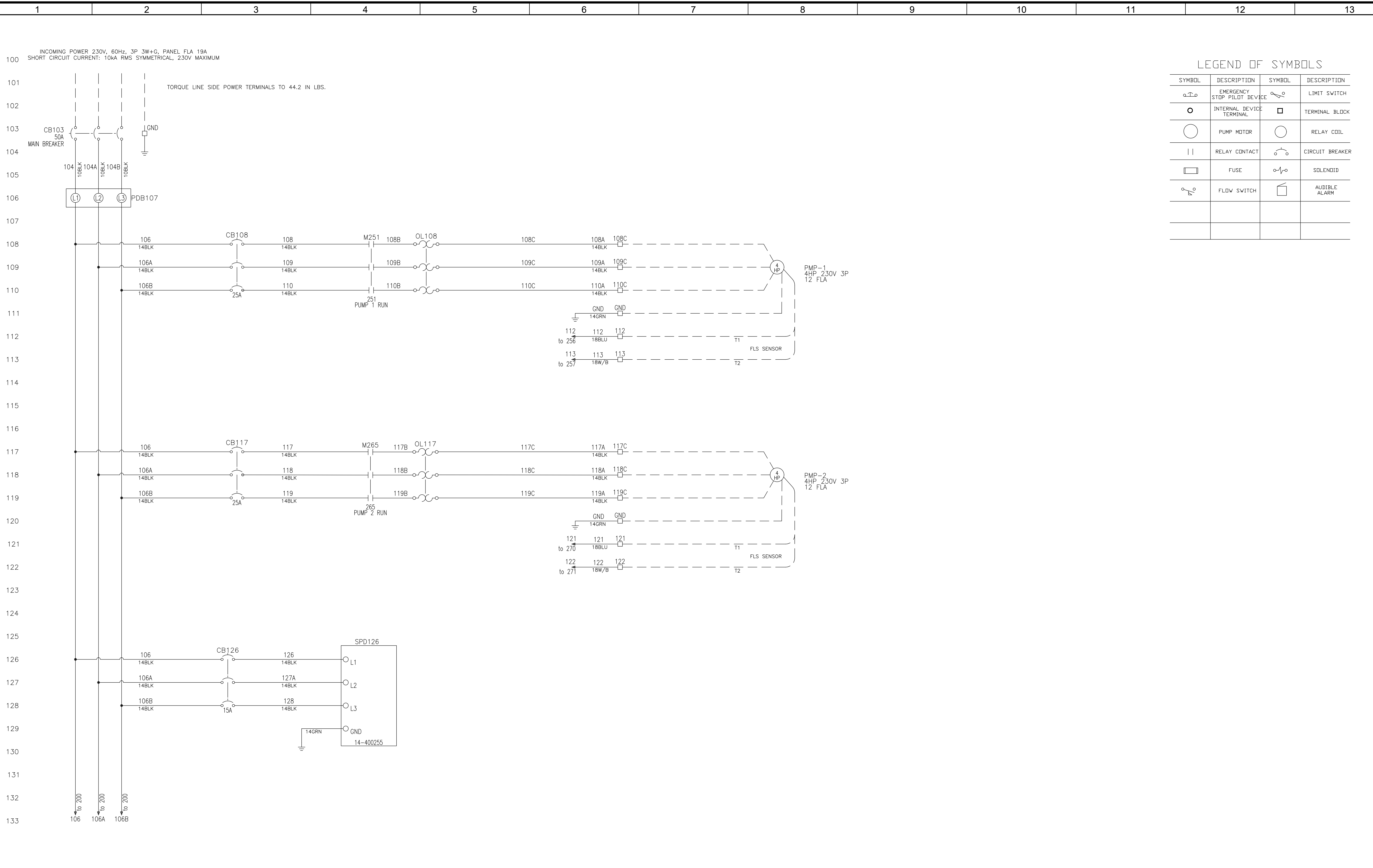
DESIGNED  
F. DELGADO  
DRAWN  
E. CHOW  
CHECKED  
DATE  
APRIL 2023



CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT**  
 PROCESS & INSTRUMENTATION DRAWING  
**PCP-1 BILL OF MATERIALS**

VERIFY SCALES  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 0 1"  
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
 DRAWING NO. **N15**  
 SHEET NO. OF



LEGEND OF SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	EMERGENCY STOP PILOT DEVICE		LIMIT SWITCH
	INTERNAL DEVICE TERMINAL		TERMINAL BLOCK
	PUMP MOTOR		RELAY COIL
	RELAY CONTACT		CIRCUIT BREAKER
	FUSE		SOLENOID
	FLOW SWITCH		AUDIBLE ALARM

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DATE APRIL 2023

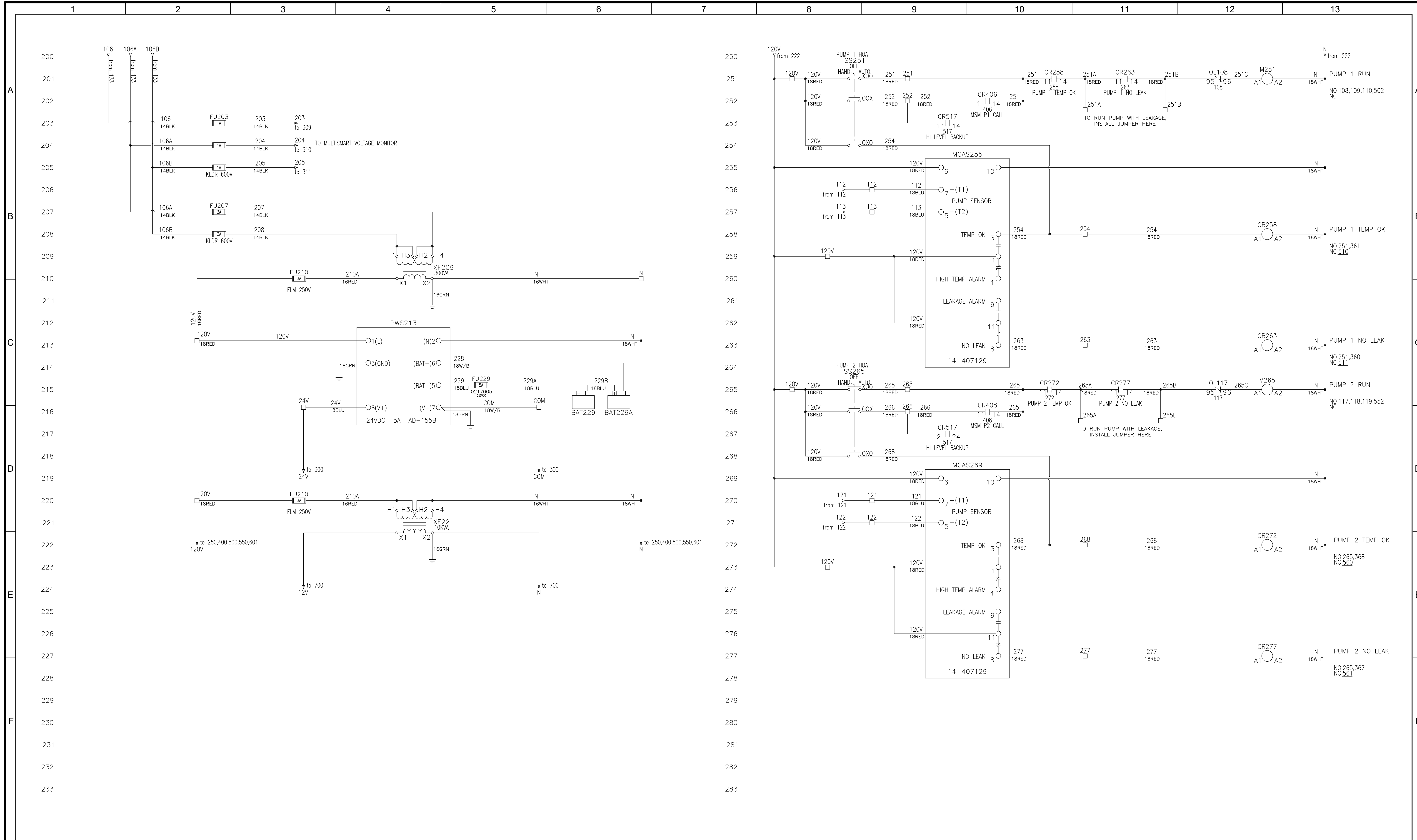


CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT  
PROCESS & INSTRUMENTATION  
PCP-1 POWER SCHEMATIC

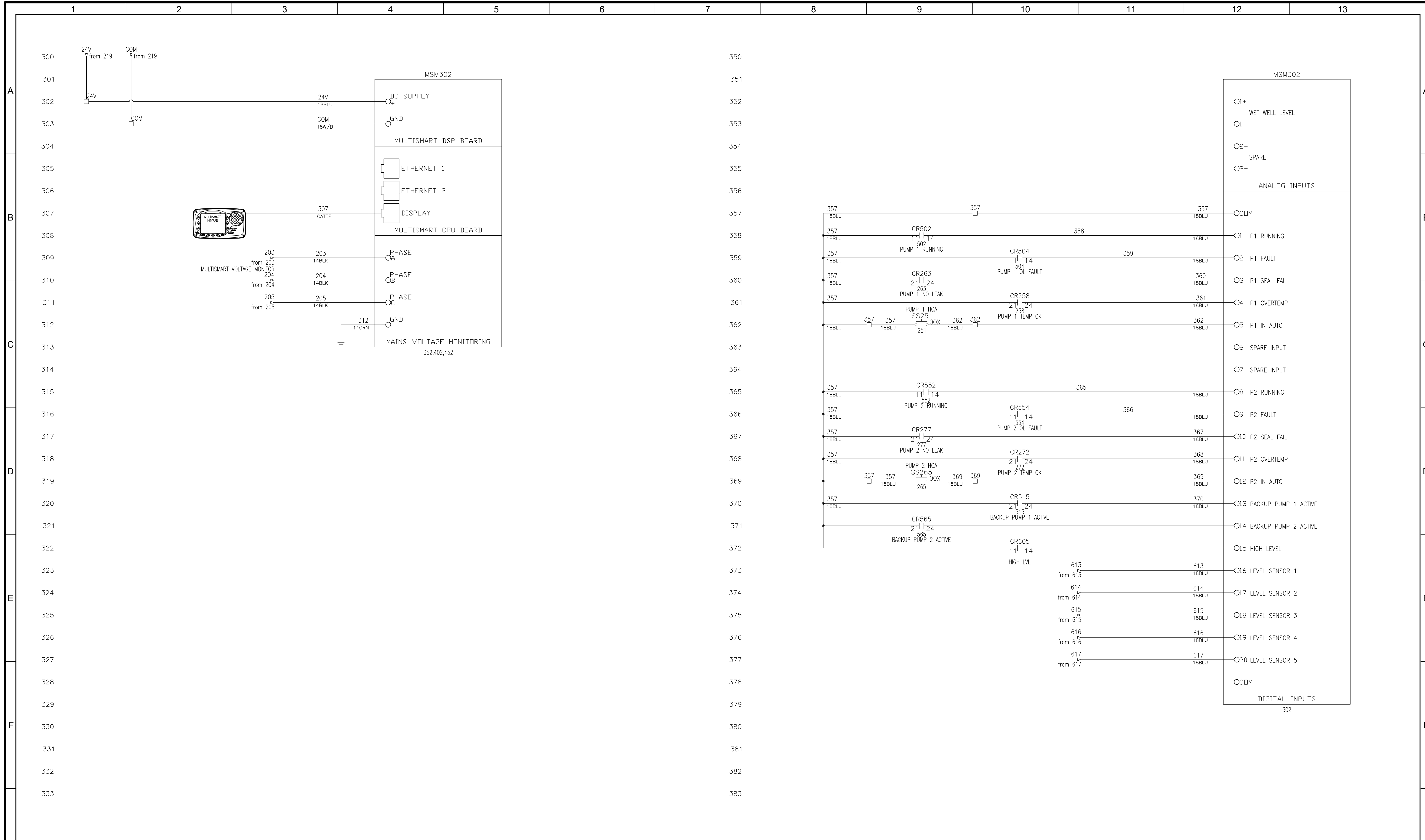
VERIFY SCALES  
BAR IS ONE INCH ON ORIGINAL DRAWING  
0 1"  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
DRAWING NO. N16  
SHEET NO. OF

REV	DATE	BY	DESCRIPTION
0	2/19/23	EC	CREATED



<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>				DESIGNED F. DELGADO	  	<b>CITY OF WEST LINN</b> <b>CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT</b> <b>PROCESS &amp; INSTRUMENTATION</b> <b>PCP-1 CONTROL DRAWING 1</b>			VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0  1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201779
				DRAWN E. CHOW		<b>N17</b>				DRAWING NO.
				CHECKED			<b>OF</b>			
0	2/19/23	EC	CREATED	DATE APRIL 2023						
REV	DATE	BY	DESCRIPTION							



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DESIGNED	F. DELGADO
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DATE	APRIL 2023

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0	2/19/23	EC	CREATED

MSM302  
DC SUPPLY  
GND  
MULTISMART DSP BOARD  
ETHERNET 1  
ETHERNET 2  
DISPLAY  
MULTISMART CPU BOARD  
PHASE OA  
PHASE OB  
PHASE OC  
GND  
MAINS VOLTAGE MONITORING  
352,402,452

CEV engineers www.ce-engrs.com

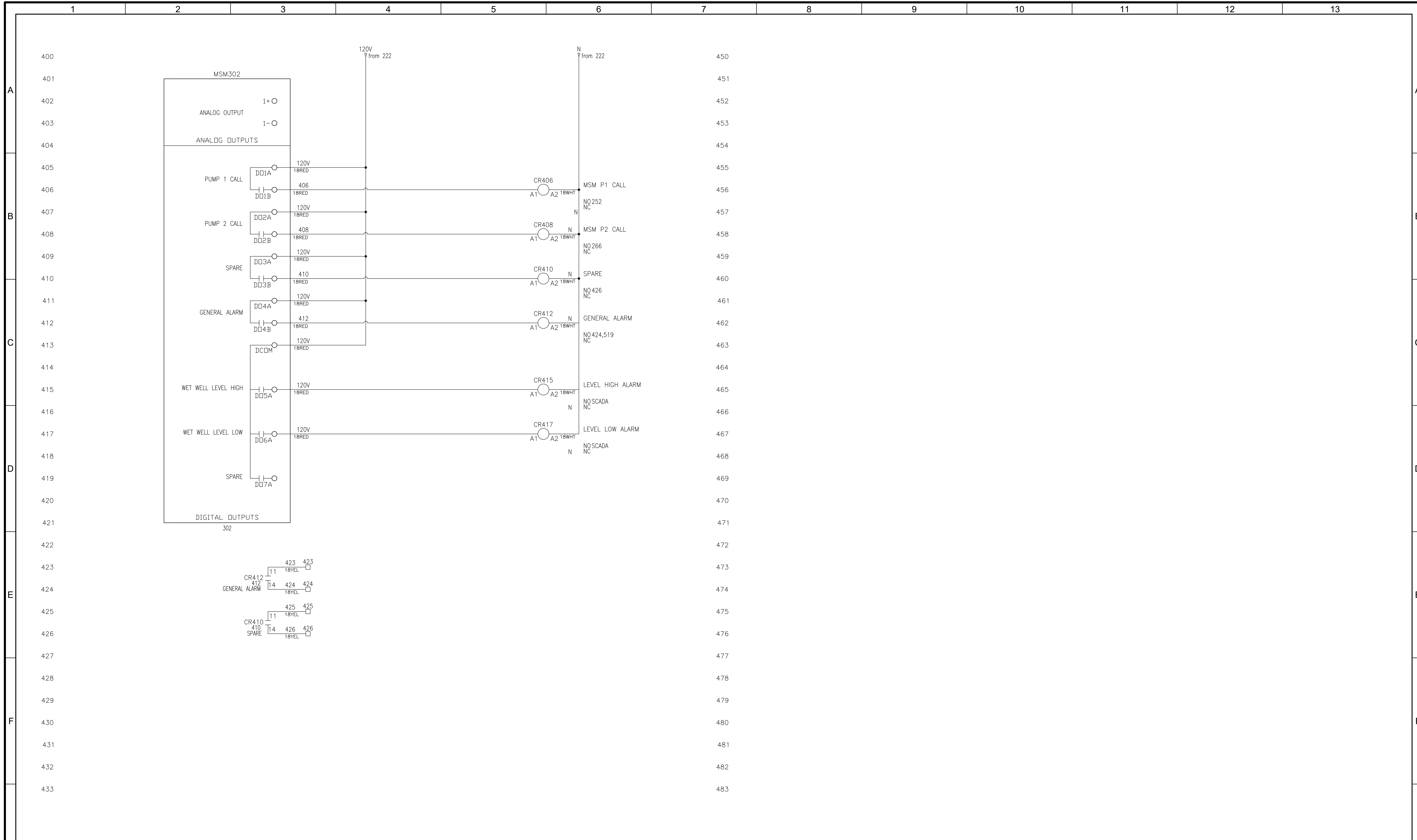
**carollo**

CITY OF West Linn

CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT  
PROCESS & INSTRUMENTATION  
PCP-1 MULTISMART INPUTS

VERIFY SCALES  
BAR IS ONE INCH ON ORIGINAL DRAWING  
0 1"  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
DRAWING NO. N18  
SHEET NO. OF



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0	2/19/23	EC	CREATED
REV	DATE	BY	DESCRIPTION

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DRAWN  
E. CHOW

CHECKED

DATE  
APRIL 2023



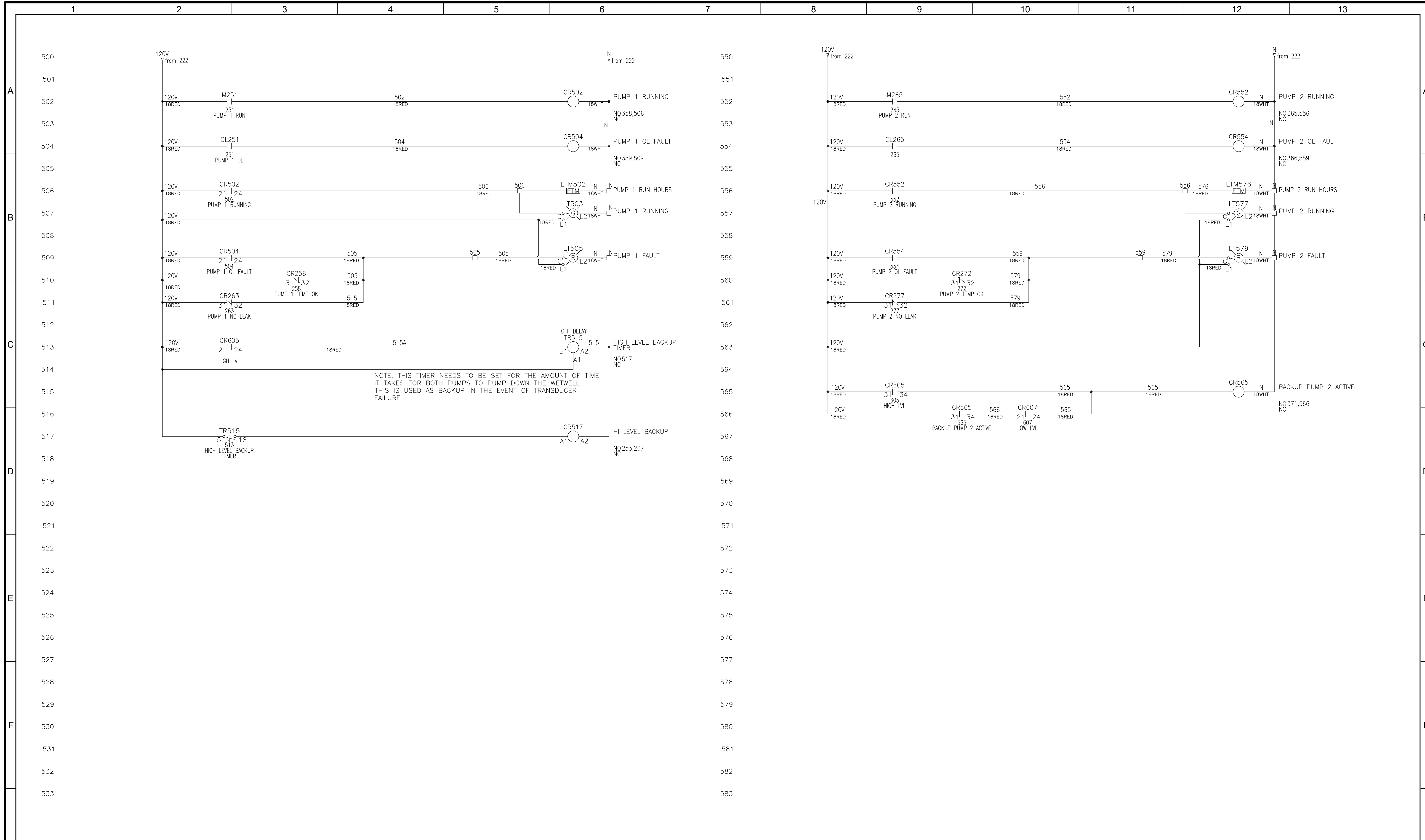
CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT**  
 PROCESS & INSTRUMENTATION  
**PCP-1 MULTISMART OUTPUTS**

VERIFY SCALES  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 0 1"

JOB NO.  
201779

DRAWING NO.  
**N19**

SHEET NO.  
OF



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REV	DATE	BY	DESCRIPTION

DESIGNED F. DELGADO	DRAWN E. CHOW	CHECKED	DATE APRIL 2023
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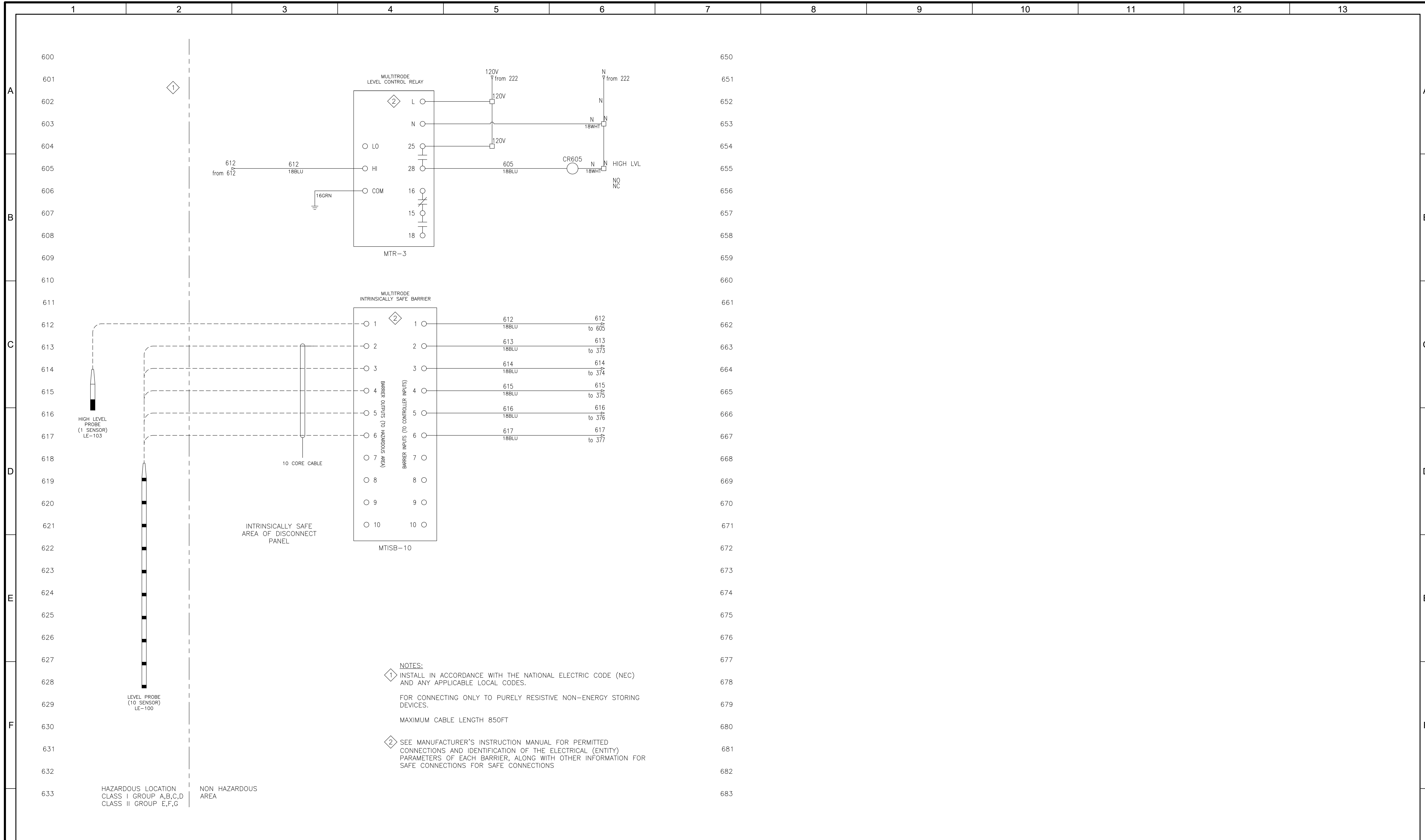




CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 PROCESS & INSTRUMENTATION  
**PCP-1 CONTROL DRAWING 2**

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201779 DRAWING NO. <b>N20</b> SHEET NO. OF
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- NOTES:**
- ① INSTALL IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC) AND ANY APPLICABLE LOCAL CODES.
  - FOR CONNECTING ONLY TO PURELY RESISTIVE NON-ENERGY STORING DEVICES.
  - MAXIMUM CABLE LENGTH 850FT
  - ② SEE MANUFACTURER'S INSTRUCTION MANUAL FOR PERMITTED CONNECTIONS AND IDENTIFICATION OF THE ELECTRICAL ENTITY PARAMETERS OF EACH BARRIER, ALONG WITH OTHER INFORMATION FOR SAFE CONNECTIONS FOR SAFE CONNECTIONS

HAZARDOUS LOCATION  
CLASS I GROUP A,B,C,D  
CLASS II GROUP E,F,G

NON HAZARDOUS  
AREA

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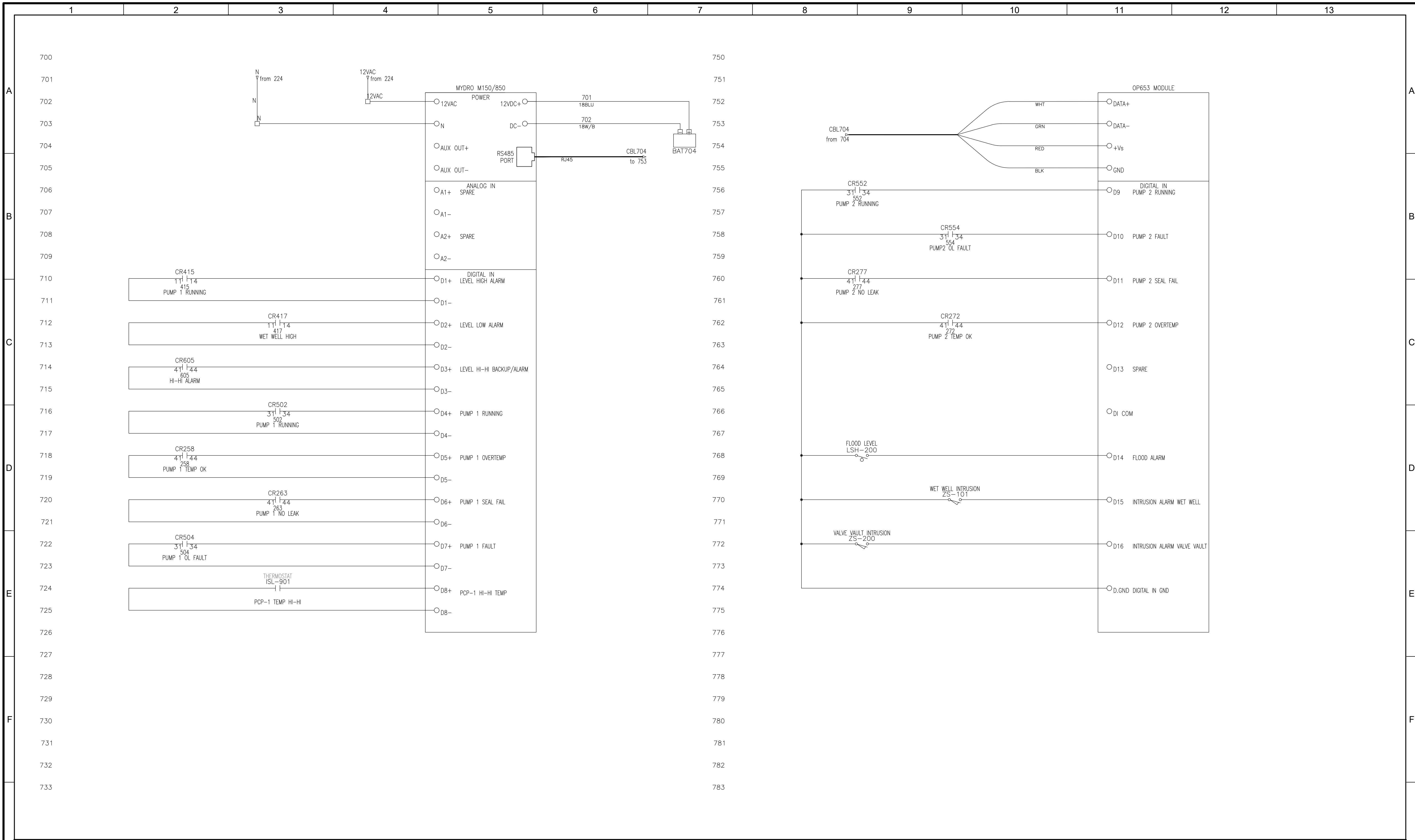




CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT

PROCESS & INSTRUMENTATION  
PCP-1 INTRINSICALLY SAFE CONTROL

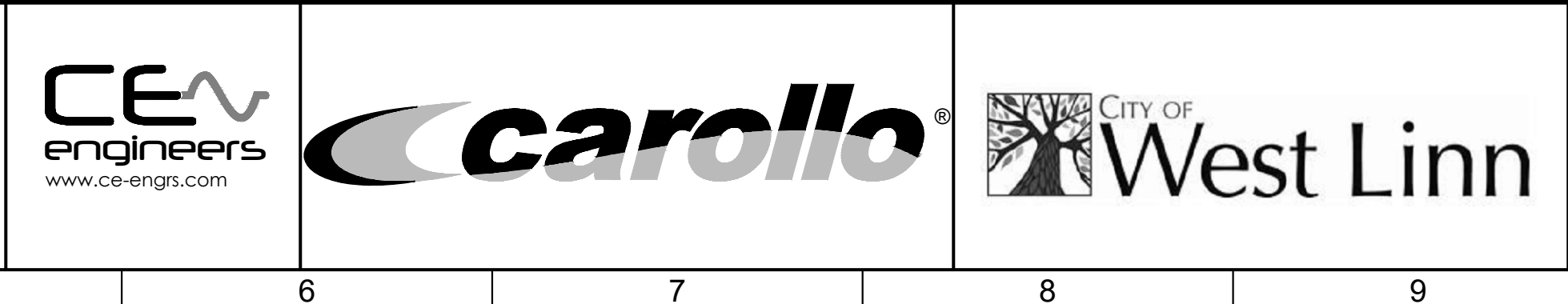
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BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. <b>N21</b>
0  1"	SHEET NO. OF
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	



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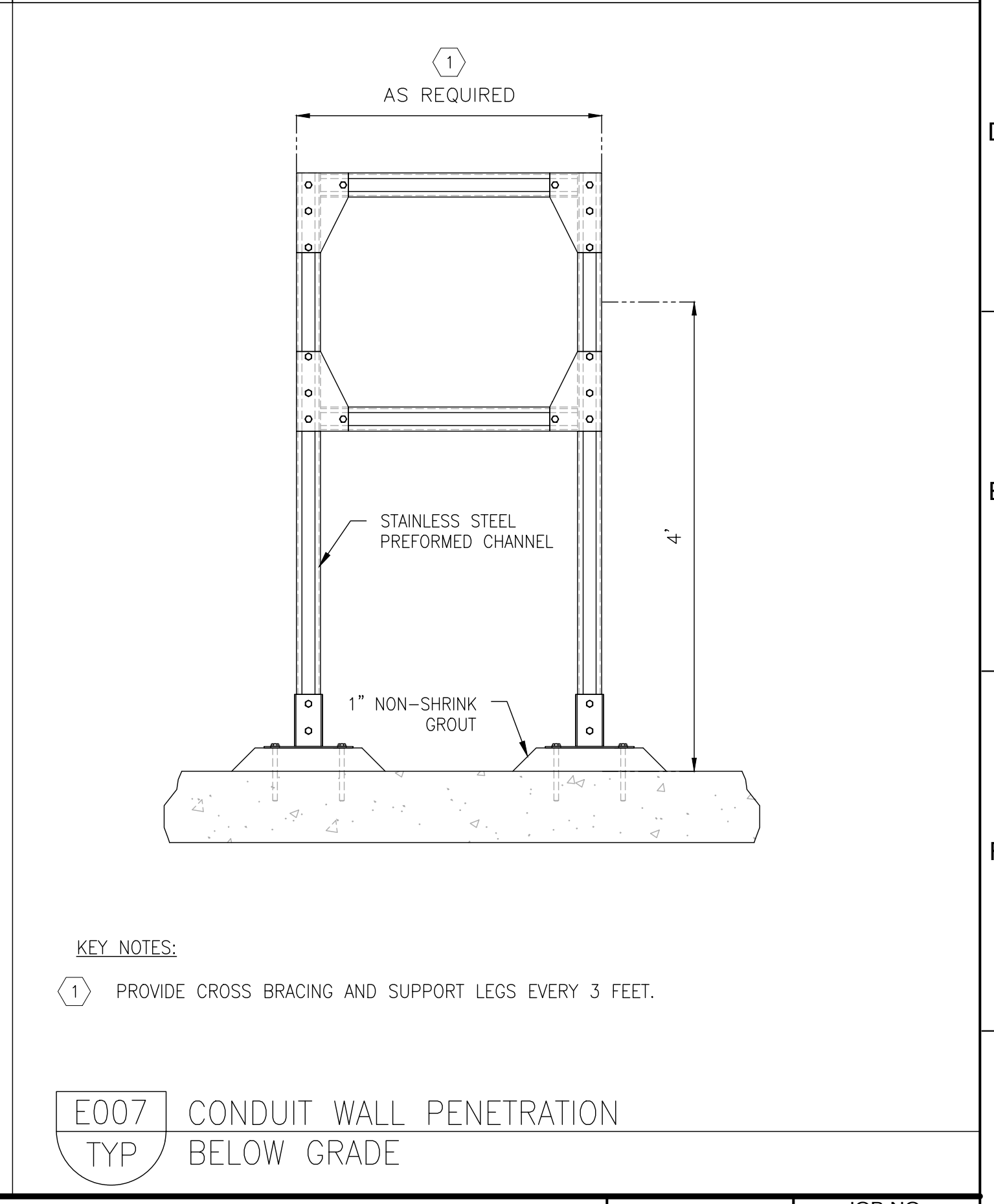
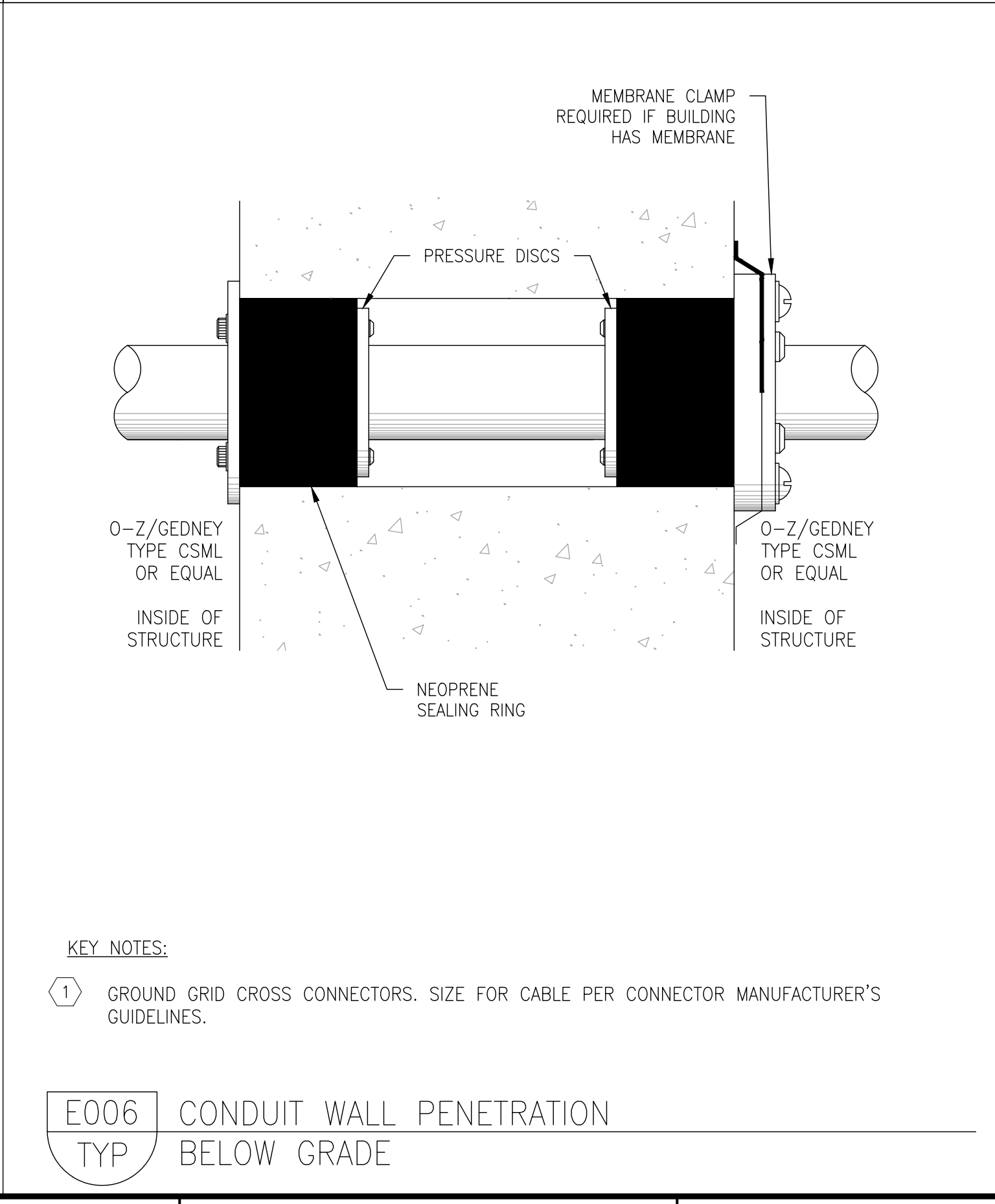
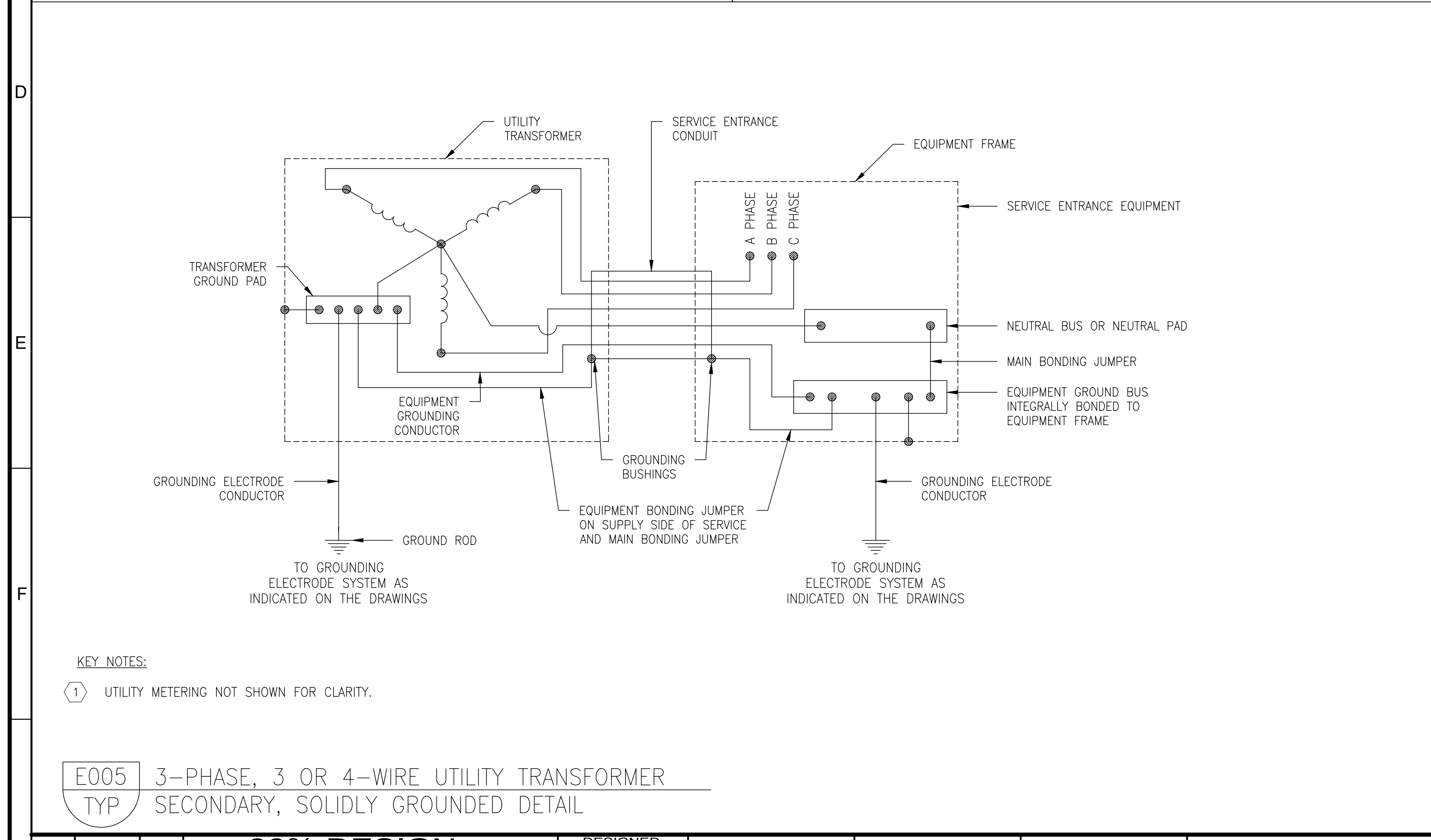
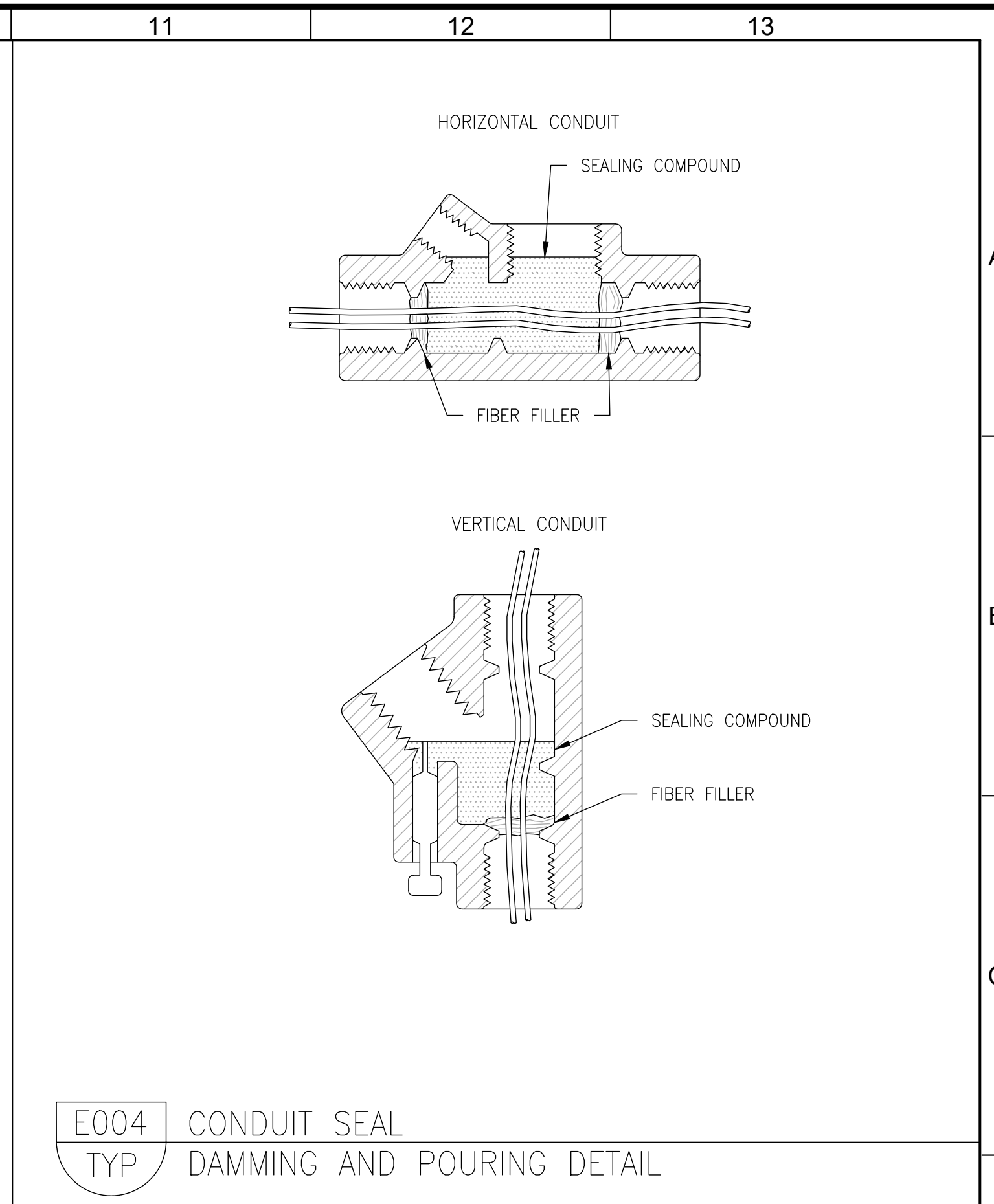
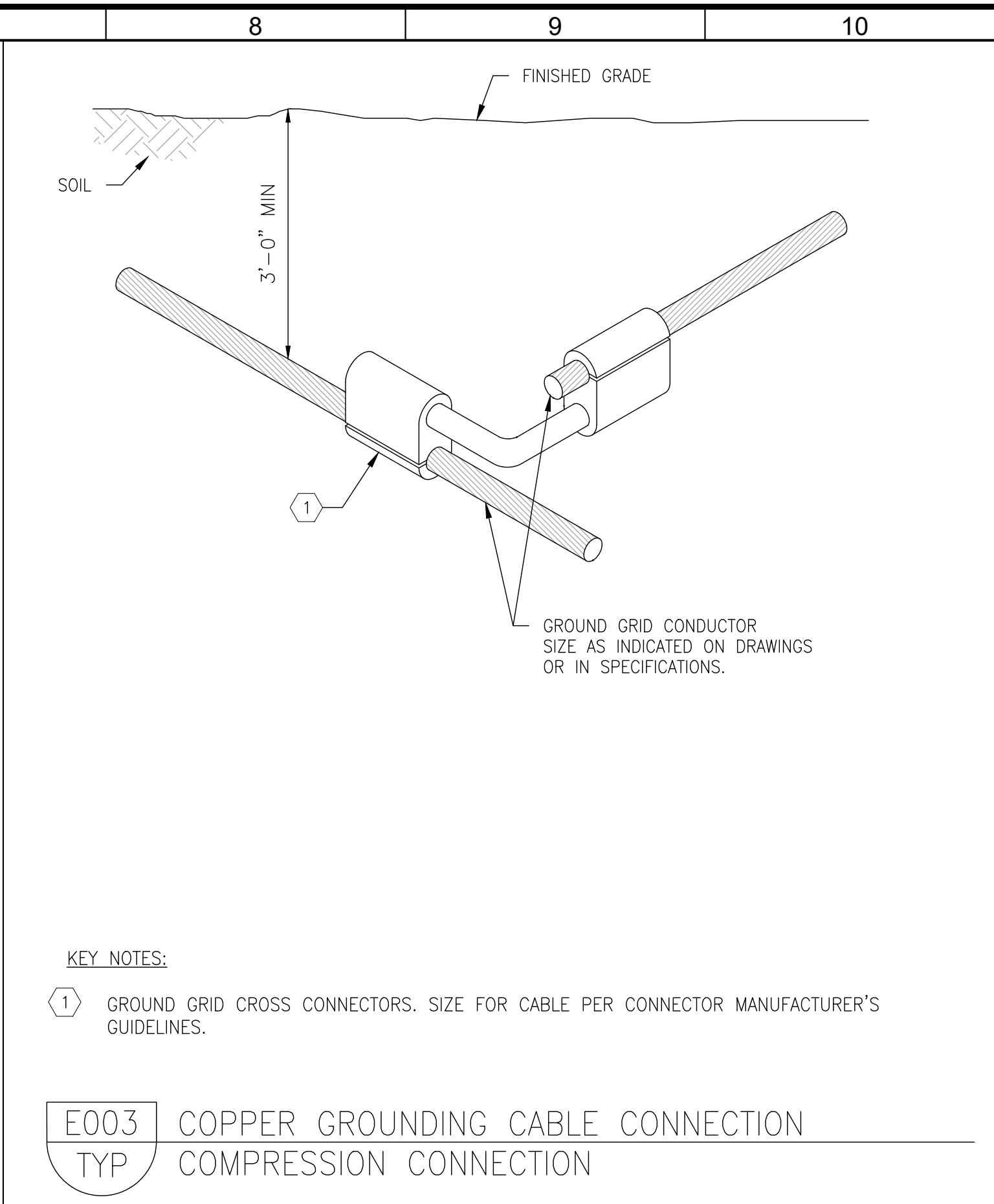
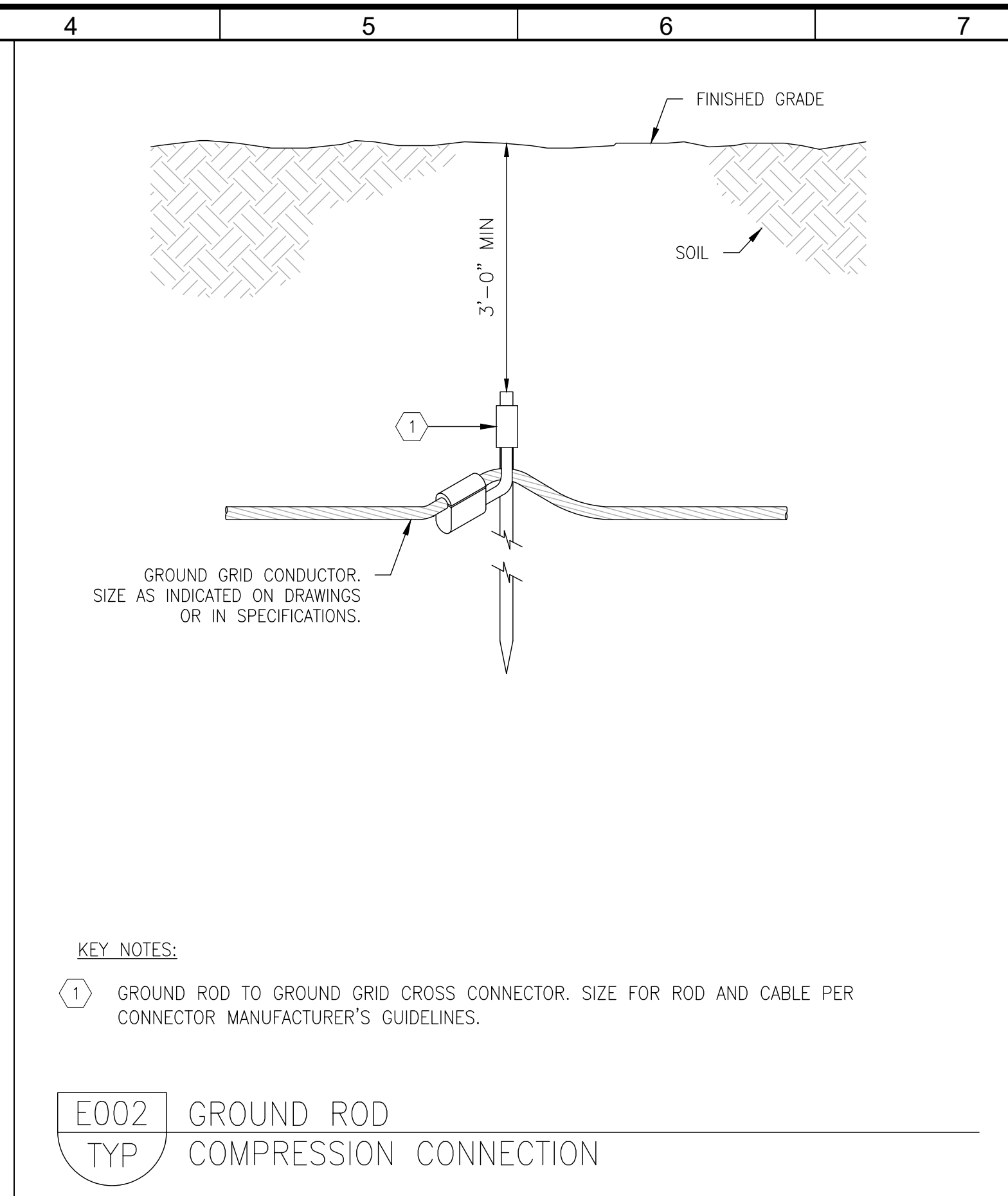
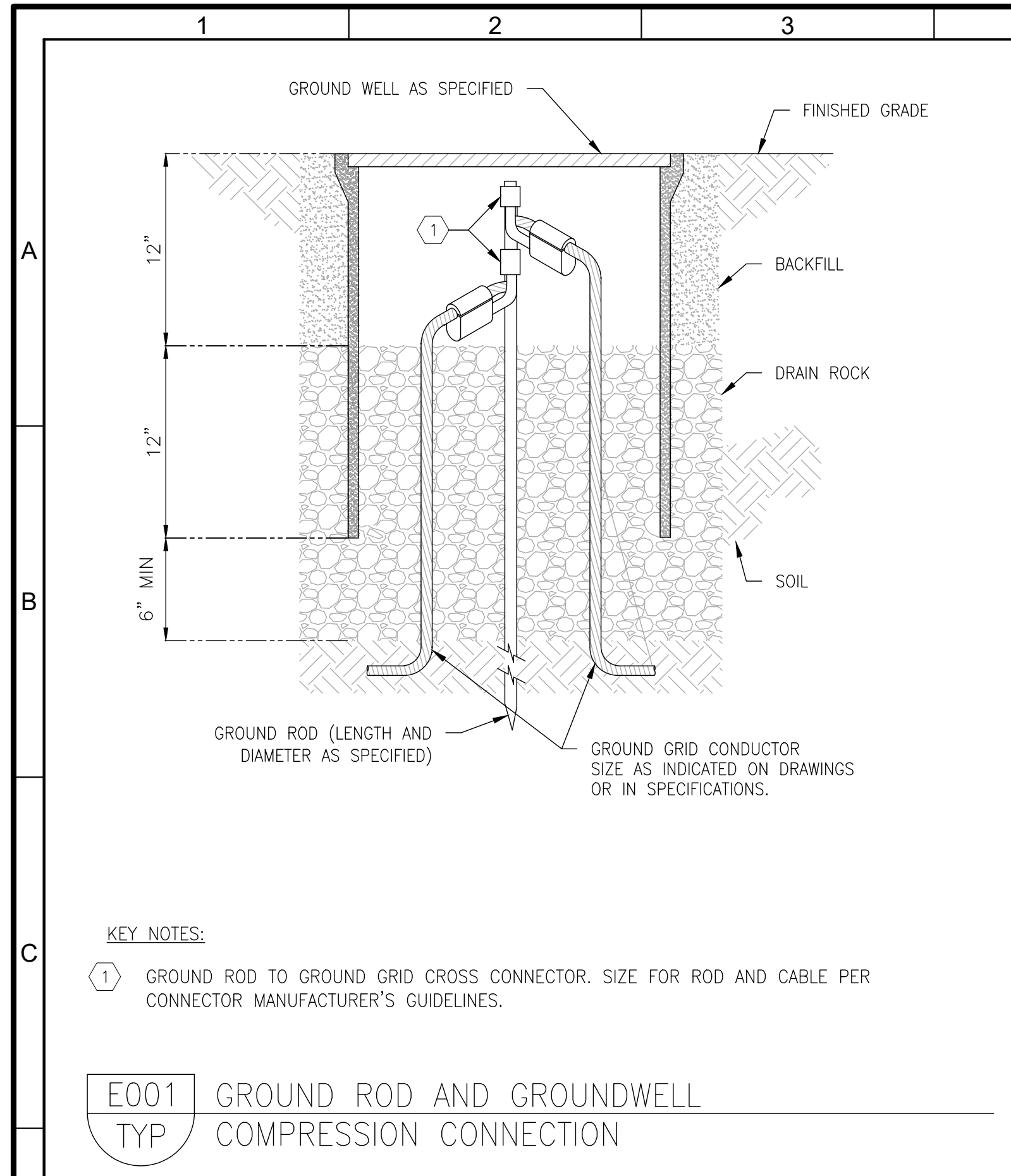
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DESIGNED F. DELGADO
DRAWN E. CHOW
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DATE APRIL 2023



CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT**  
 PROCESS & INSTRUMENTATION  
 PCP-1 SCADA SYSTEM


VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"	JOB NO. 201779
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	DRAWING NO. <b>N22</b>
	SHEET NO. OF



<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED	F. DELGADO		
DRAWN	E. CHOW		
CHECKED			
DATE	APRIL 2023		
REV	DATE	BY	DESCRIPTION
0	2/19/23	EC	CREATED

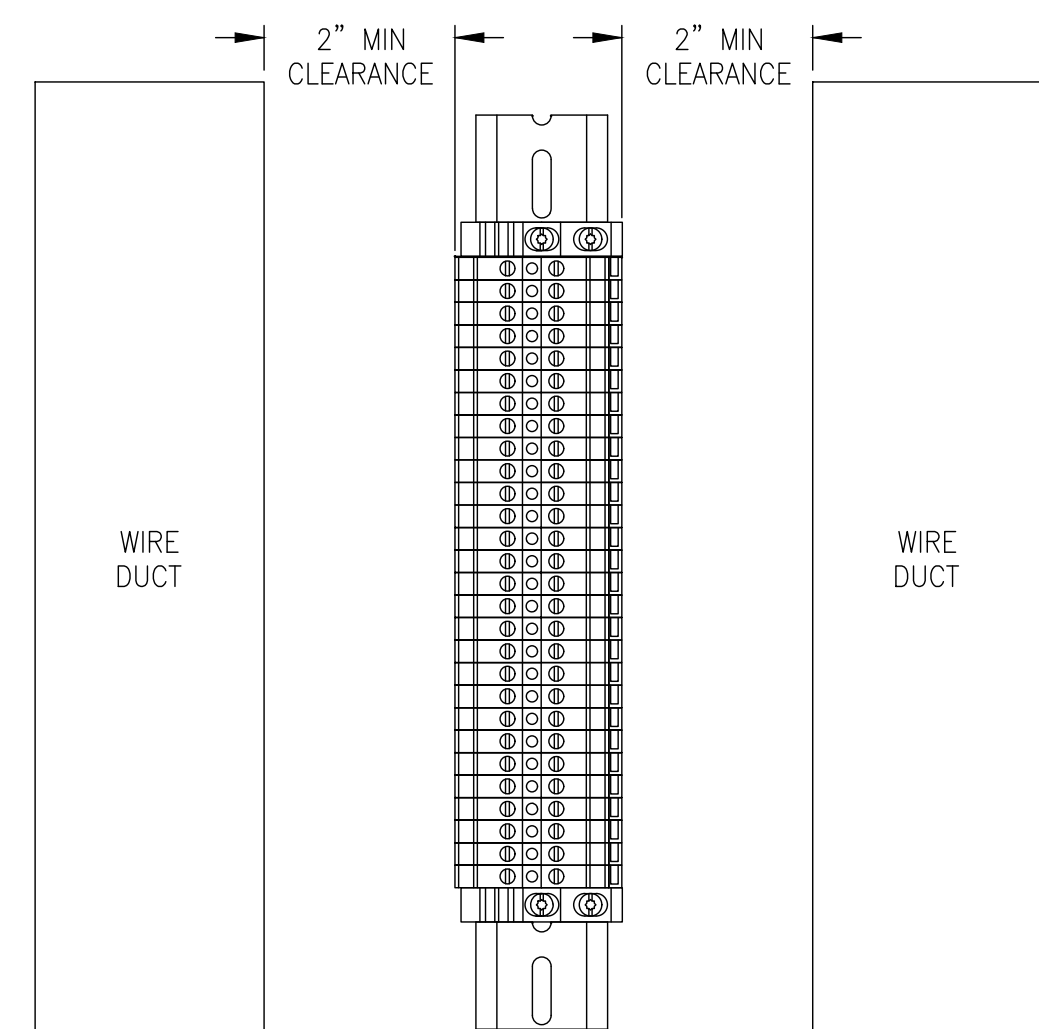
DESIGNED	F. DELGADO
DRAWN	E. CHOW
CHECKED	
DATE	APRIL 2023



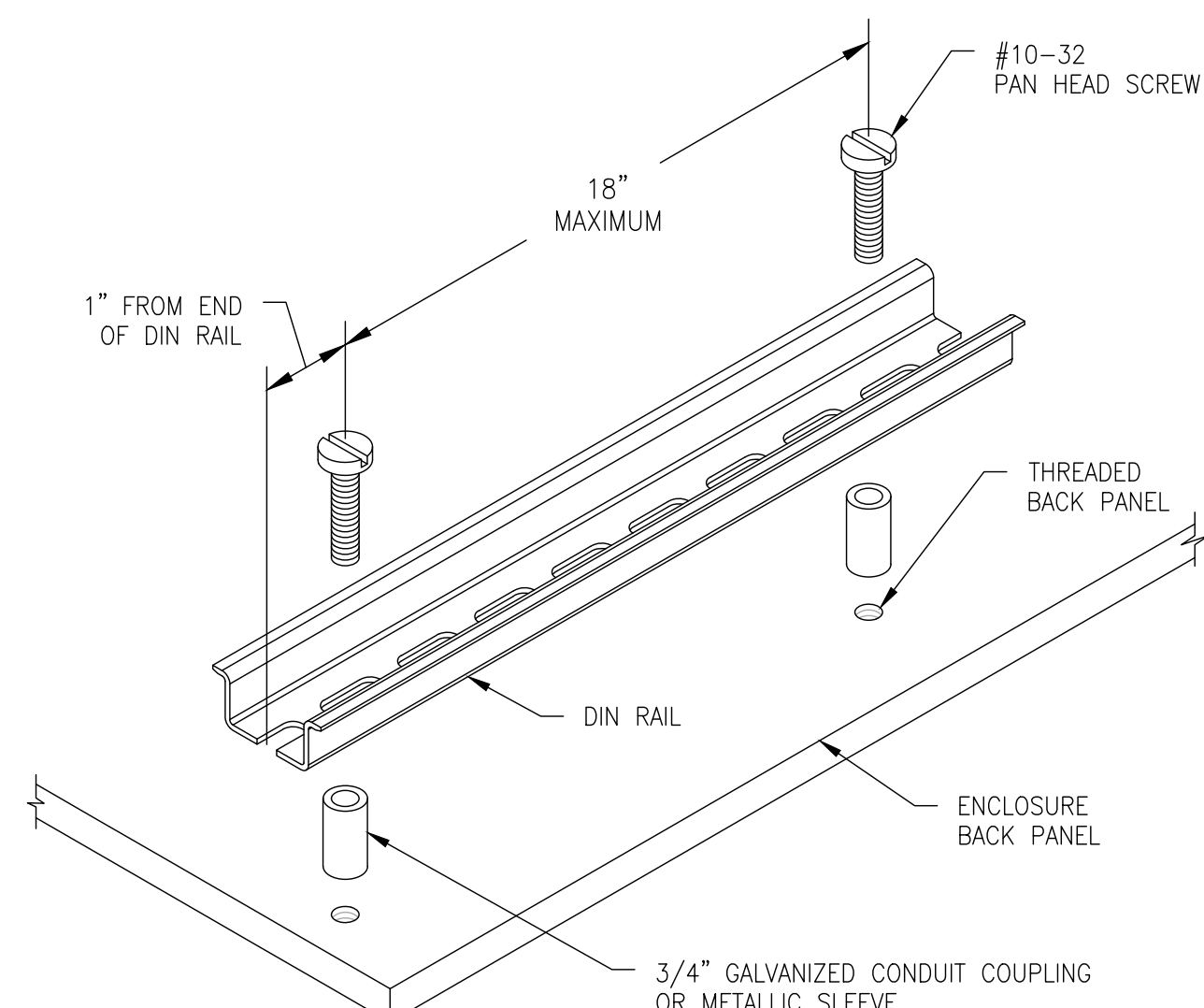


CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 TYPICAL DETAILS  
 PAGE 1

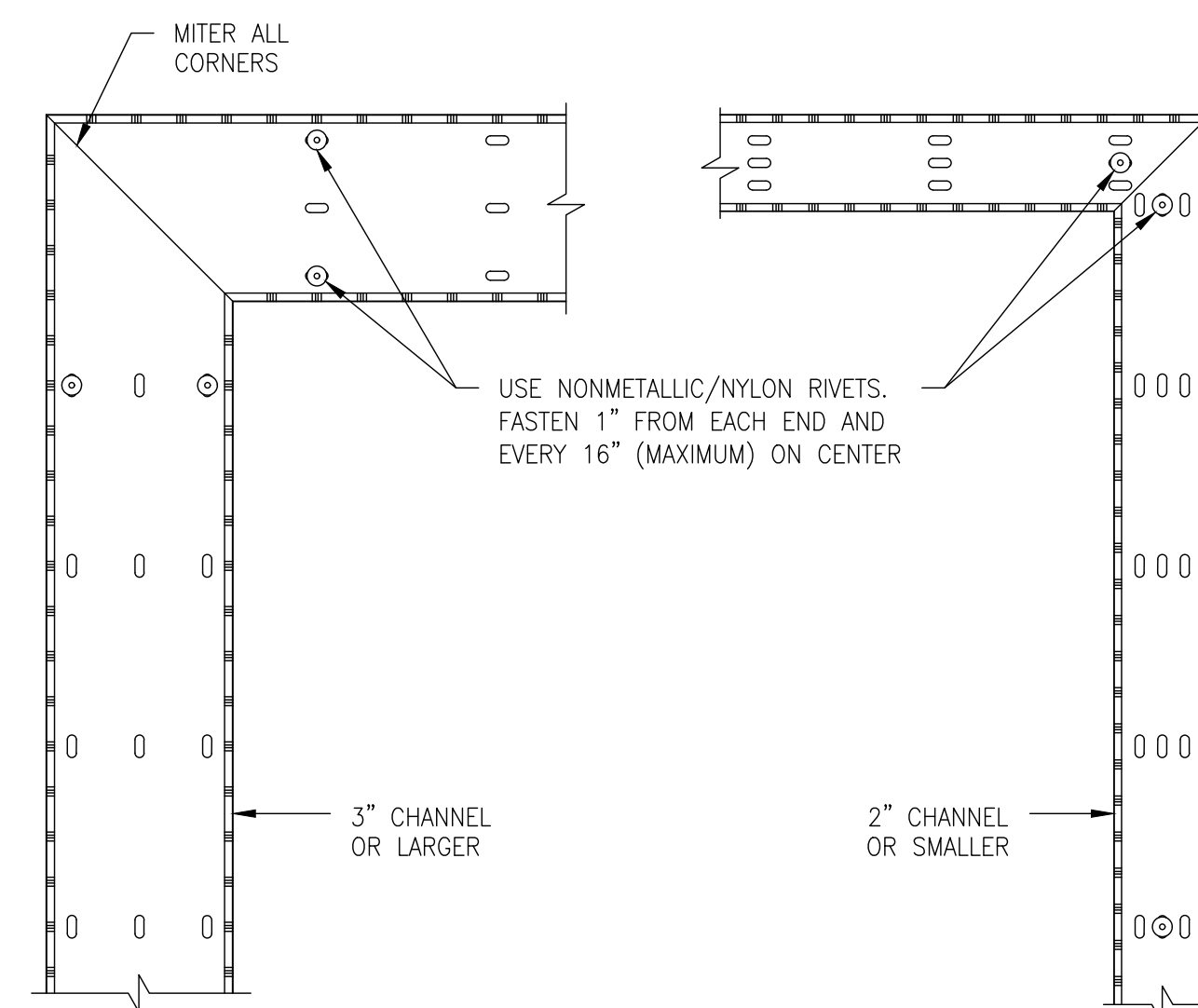
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BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. N23
0 1"	SHEET NO. OF
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	



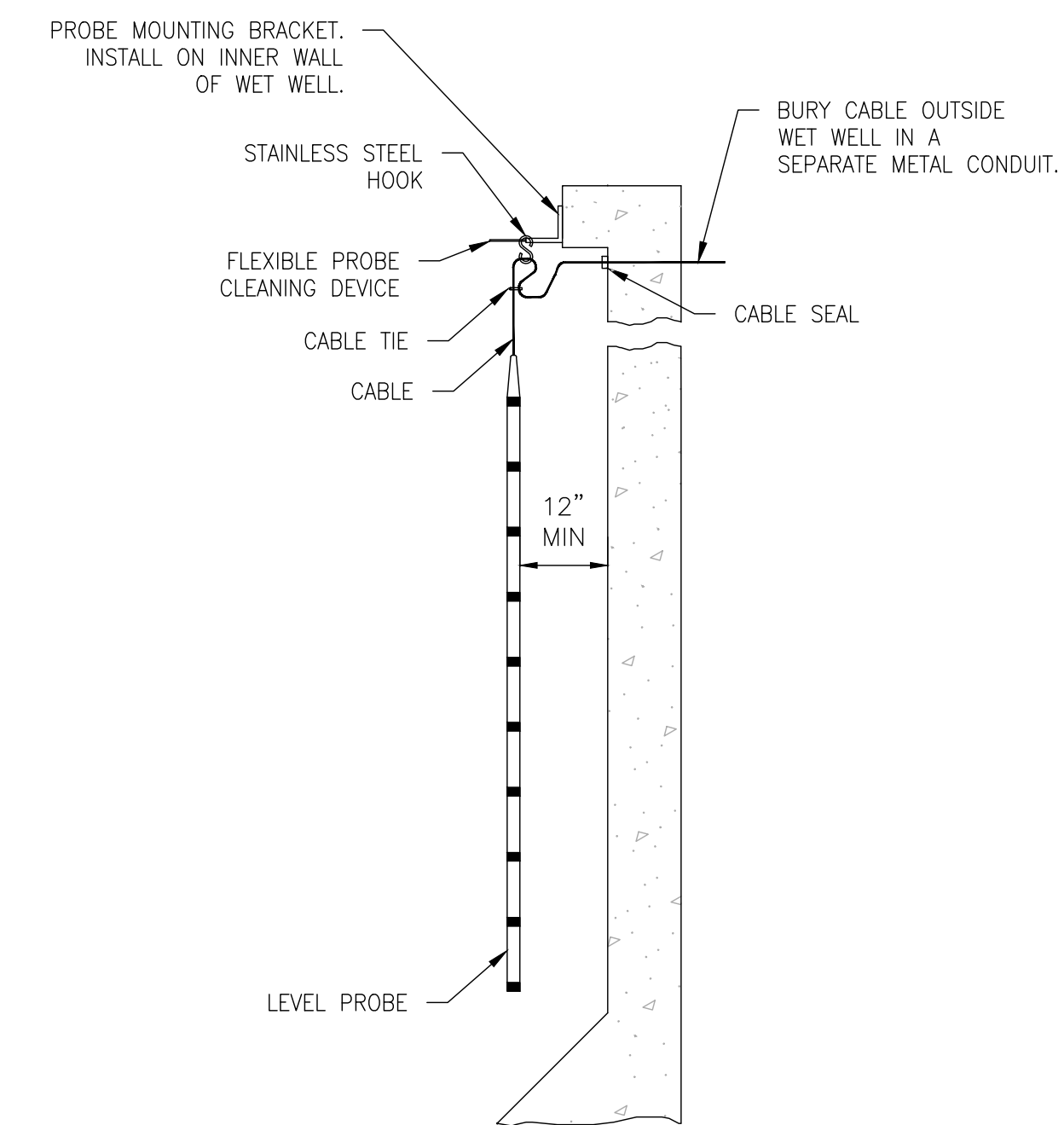
**E008** TYP TERMINAL BLOCK CLEARANCE



**E009** TYP DIN RAIL MOUNTING

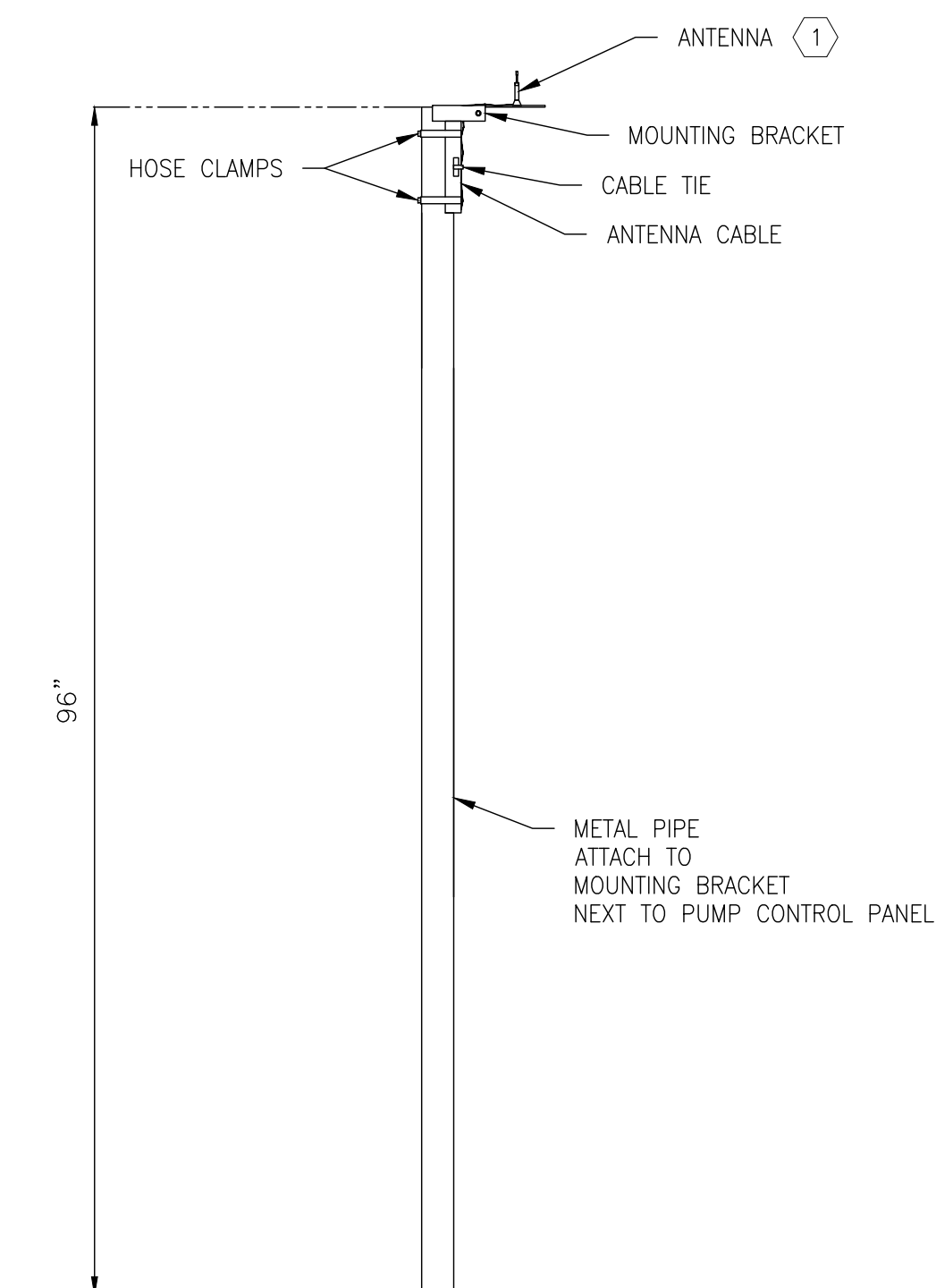


**E010** TYP PANEL WIRING DUCT MOUNTING



KEY NOTES:  
 ① INSTALL LEVEL PROBE PER MANUFACTURER'S INSTRUCTIONS.

**E011** TYP LEVEL PROBE WET WELL INSTALLATION



KEY NOTES:  
 ① INSTALL ANTENNA PER MANUFACTURER'S INSTRUCTIONS.

**E012** TYP DATA COMMUNICATION REMOTE TERMINAL UNIT CELLULAR SIGNAL ANTENNA MOUNTING

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED	F. DELGADO		
DRAWN	E. CHOW		
CHECKED			
DATE	APRIL 2023		
REV	DATE	BY	DESCRIPTION
0	2/19/23	EC	CREATED

DESIGNED	F. DELGADO
DRAWN	E. CHOW
CHECKED	
DATE	APRIL 2023





CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT  
 TYPICAL DETAILS  
 PAGE 2

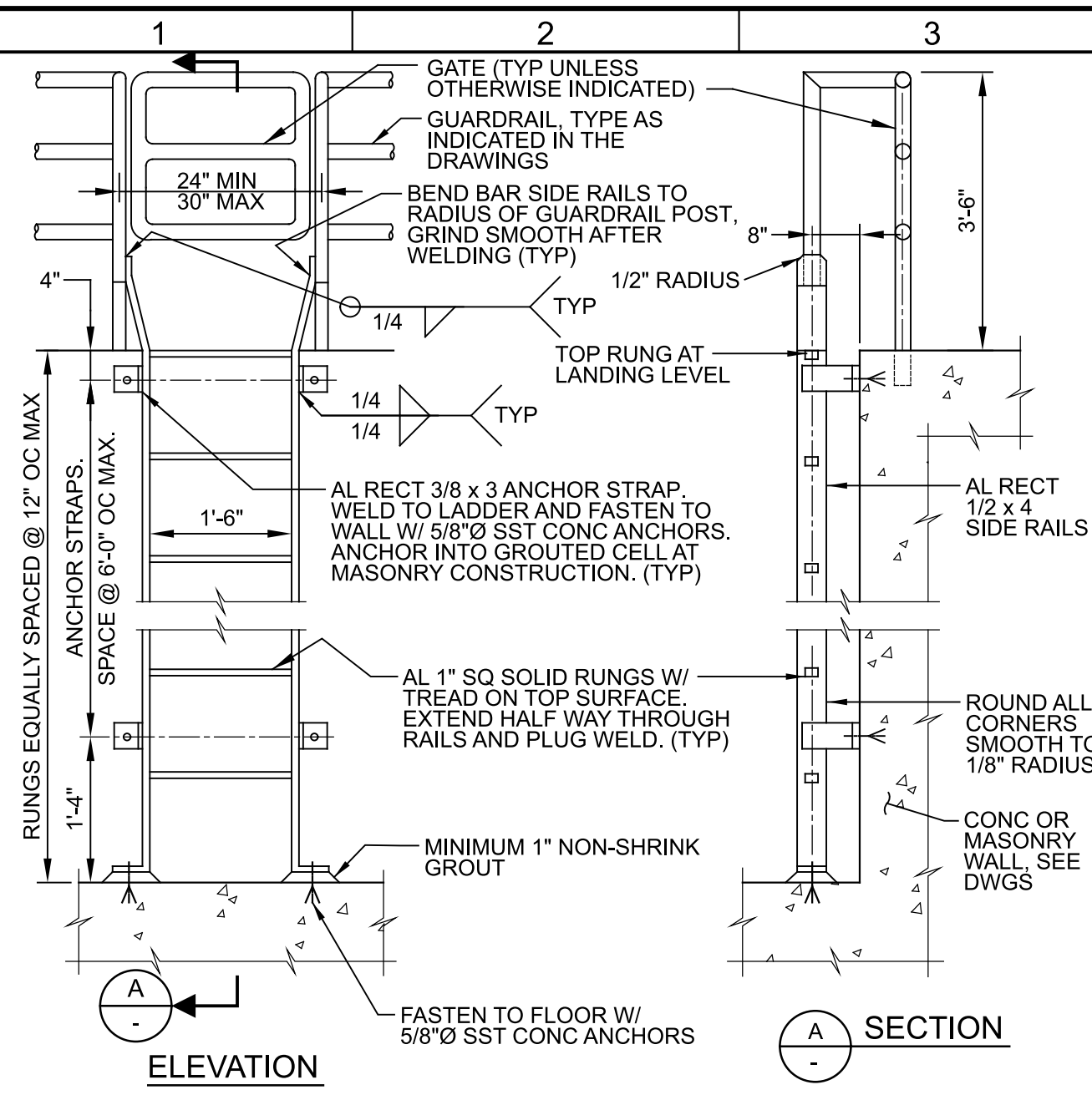
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. OF

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User: svcPW

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo Std Pen\_v0905.pen PlotScale: 1:1

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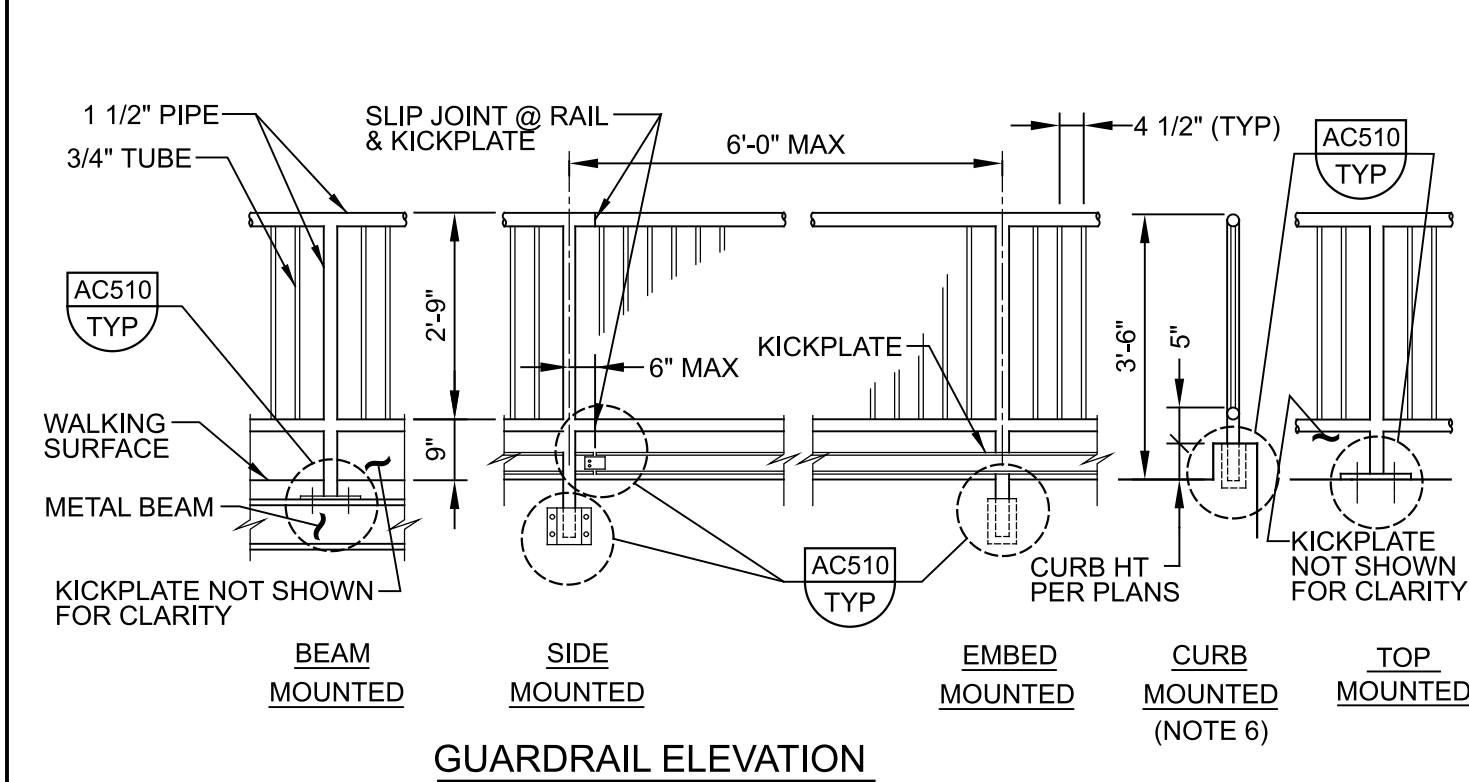
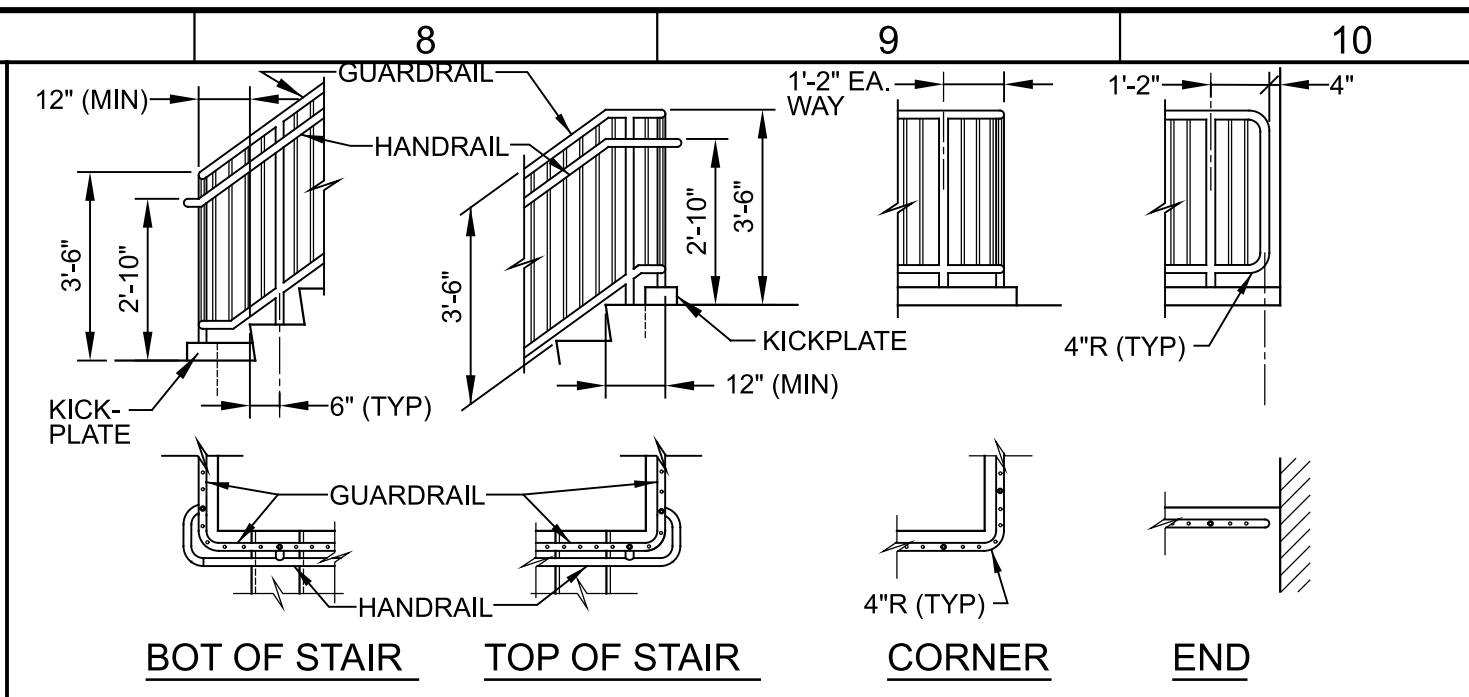


- NOTES:**
- INSTALL FALL PREVENTION SYSTEM PER SPEC WHERE HEIGHT OF LADDER EXCEEDS 24'-0".
  - MINIMUM CLEARANCE TO ANY OBSTRUCTION ADJACENT TO LADDER: 2'-6" ON CLIMBING SIDE (2'-3" AT SMOOTH WALL), 1'-3" EACH SIDE OF CENTER LINE, ON EACH SIDE OF LADDER.
  - COAT ALL AL SURFACES IN CONTACT W/ CONC AND MASONRY, AND INSTALL ISOLATION SLEEVES AND WASHERS AT DISSIMILAR METALS, AS SPECIFIED.
  - WHERE GUARDRAIL IS SST, BOLT PIPE TO RAIL W/ 2 - 1/2" Ø SST BOLTS.

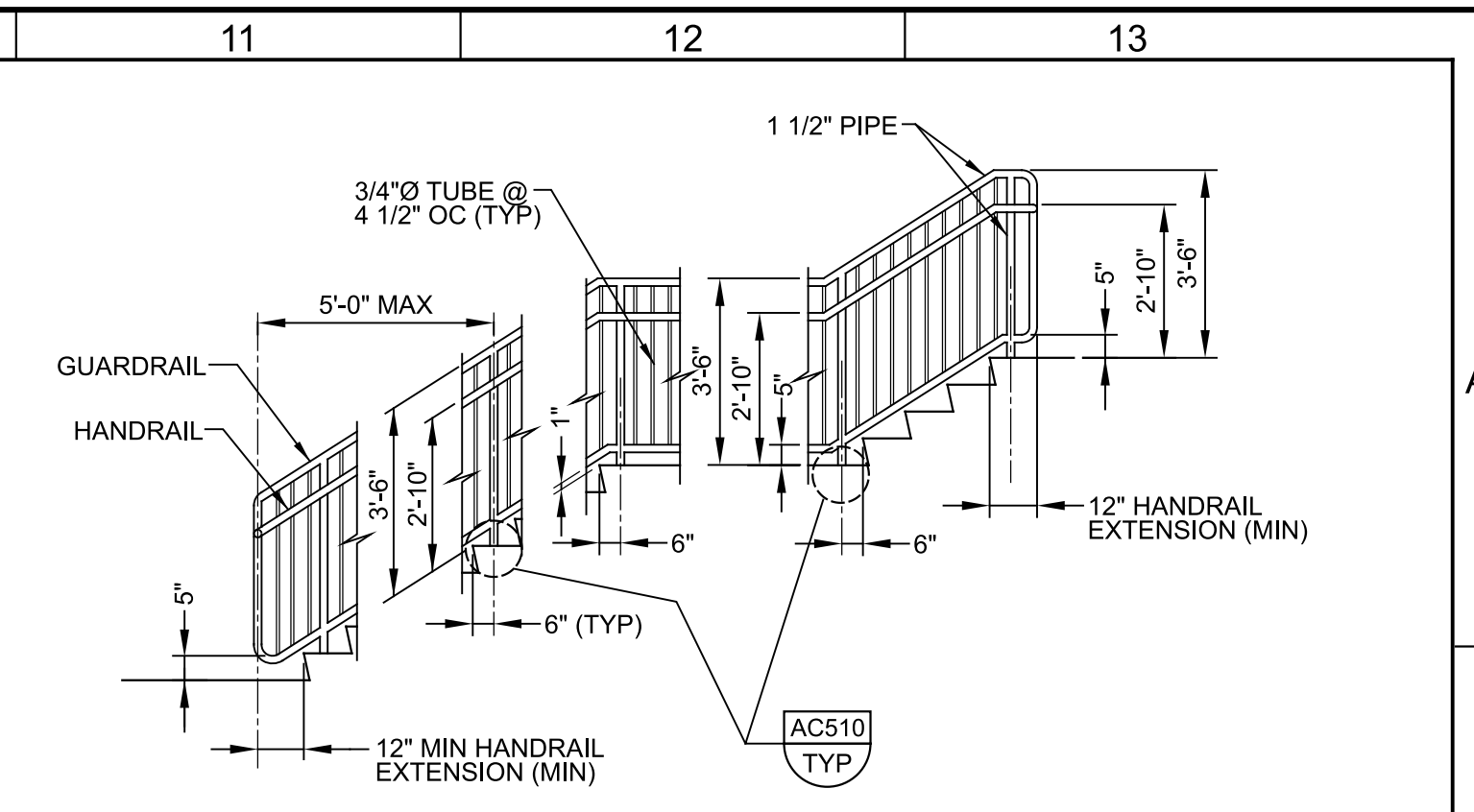
**AC300** LADDER - ALUMINUM - WALL  
TYP NS 12/28/20

- NOTES:**
- PROVIDE GUARDRAILS AT STAIRS AND AT OPEN SIDED WALKING SURFACES THAT ARE ELEVATED MORE THAN 30" ABOVE GRADE OR ADJACENT CONSTRUCTION.
  - WHERE EQUIPMENT IS LOCATED LESS THAN 10' FROM EDGE OF ROOF AND ELEVATED MORE THAN 30" ABOVE GRADE OR ADJACENT CONSTRUCTION, PROVIDE 42" HIGH GUARDRAIL FORMING A PROTECTIVE BARRIER. PARAPET WALL 42" OR MORE IN HEIGHT MAY BE THE GUARDRAIL AT ROOF LOCATIONS.
  - SEE DRAWINGS AND SPECIFICATIONS FOR GUARDRAIL MATERIAL TYPE(S).
  - PROVIDE HANDRAIL AT BOTH SIDES OF EVERY STAIR HAVING 2 OR MORE RISERS.
  - PROVIDE CONTINUOUS HANDRAIL GRIPPING SURFACES FOR THE FULL LENGTH OF THE STAIR.
  - PROVIDE HANDRAIL EXTENSIONS AT BOTH SIDES OF STAIRS AT TOP AND BOTTOM. HANDRAIL EXTENSION ON STAIR MOUNTED GUARDRAIL MAY BE OMITTED WHERE IT IS PERPENDICULAR TO AND IMPEDES EXIT FLOW.
  - MAKE INSIDE HANDRAIL ON SWITCHBACK STAIRS CONTINUOUS.
  - FOR WALL MOUNTED HANDRAILS, PROVIDE SINGLE RAIL WITH TOP OF RAIL AT 2'-10" HEIGHT ABOVE LANDINGS OR TREAD NOSINGS. PROVIDE MATCHING HANDRAIL ON OPPOSITE SIDE.
  - GUARDRAIL SHALL BE FIXED UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
  - PLACE CENTER OF EMBEDDED POSTS 6" FROM EDGE OF CONCRETE AND 6" FROM FRONT EDGE OF CONCRETE STAIR NOSINGS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
  - PLACE GUARDRAIL POSTS OPPOSITE EACH OTHER WHERE RAILINGS ARE PARALLEL.
  - FOR GUARDRAIL POSTS MOUNTED TO BEAM OR STAIR CHANNEL, PROVIDE MANUFACTURERS REINFORCED CONNECTION FROM POST TO PLATE. PLATE AND REINFORCED INSERTS SHALL BE ALUMINUM OR STAINLESS STEEL.
  - PROVIDE SLIDING JOINTS AT 24" MAX SPACING FOR EXPANSION OF RAIL AND KICKPLATE. LOCATE SLIDING JOINTS NEAR FACE OF POST. GAP AT TIME OF INSTALLATION SHALL BE BASED ON TEMPERATURE OF GUARDRAIL. PROVIDE 1/4" GAP AT 100°F AND 5/8" GAP AT 0°F. INTERPOLATE GAP FOR OTHER INSTALLATION TEMPERATURES. AT CONCRETE EXPANSION JOINTS, PROVIDE MINIMUM 1" GAP IN SLIDING JOINTS BUT NOT LESS THAN WIDTH OF CONCRETE EXPANSION JOINT. MAKE INSERT SLEEVES IN RAILS LONG ENOUGH TO ALLOW FOR THE FULL RANGE OF MOVEMENT.
  - MATERIAL FOR KICKPLATE CHANNEL SLIDING JOINT PLATES, SHALL BE OF THE SAME MATERIAL AS THE GUARDRAIL.
  - JOINTS FOR STAINLESS STEEL GUARDRAIL AND HANDRAIL SHALL BE COPED, WELDED, AND GROUND SMOOTH.
  - PROVIDE KICKPLATE AT ALL LOCATIONS EXCEPT AT SLOPING GUARDRAIL ON STAIRS AND WHERE GUARDRAIL IS MOUNTED ON A 4" MIN CURB. KICKPLATE MAY BE EXTENDED OR BENT PLATE AND SHALL BE ATTACHED WITH SST BOLTS IN 5/16" x 3/4" SLOTTED HOLES. BOLT KICKPLATE TO POST WITH CLEAR ABOVE FLOOR. PROVIDE 1/2" CLEAR ABOVE FLOOR. PROVIDE GUARDRAIL. PROVIDE STANDARD SPACER BLOCK BETWEEN POST AND KICKPLATE TO MAINTAIN 1/4" MAX CLEAR SPACING. HAND TIGHTEN AND CENTER PUNCH BOLT THREADS TO LOCK.
  - COAT SURFACES OF ALUMINUM IN CONTACT WITH CONCRETE AS SPECIFIED. PROVIDE NEOPRENE GASKET BETWEEN ALUMINUM AND STEEL.

**AC500** GUARDRAIL - HANDRAIL - NOTES  
TYP NS 06/21/19

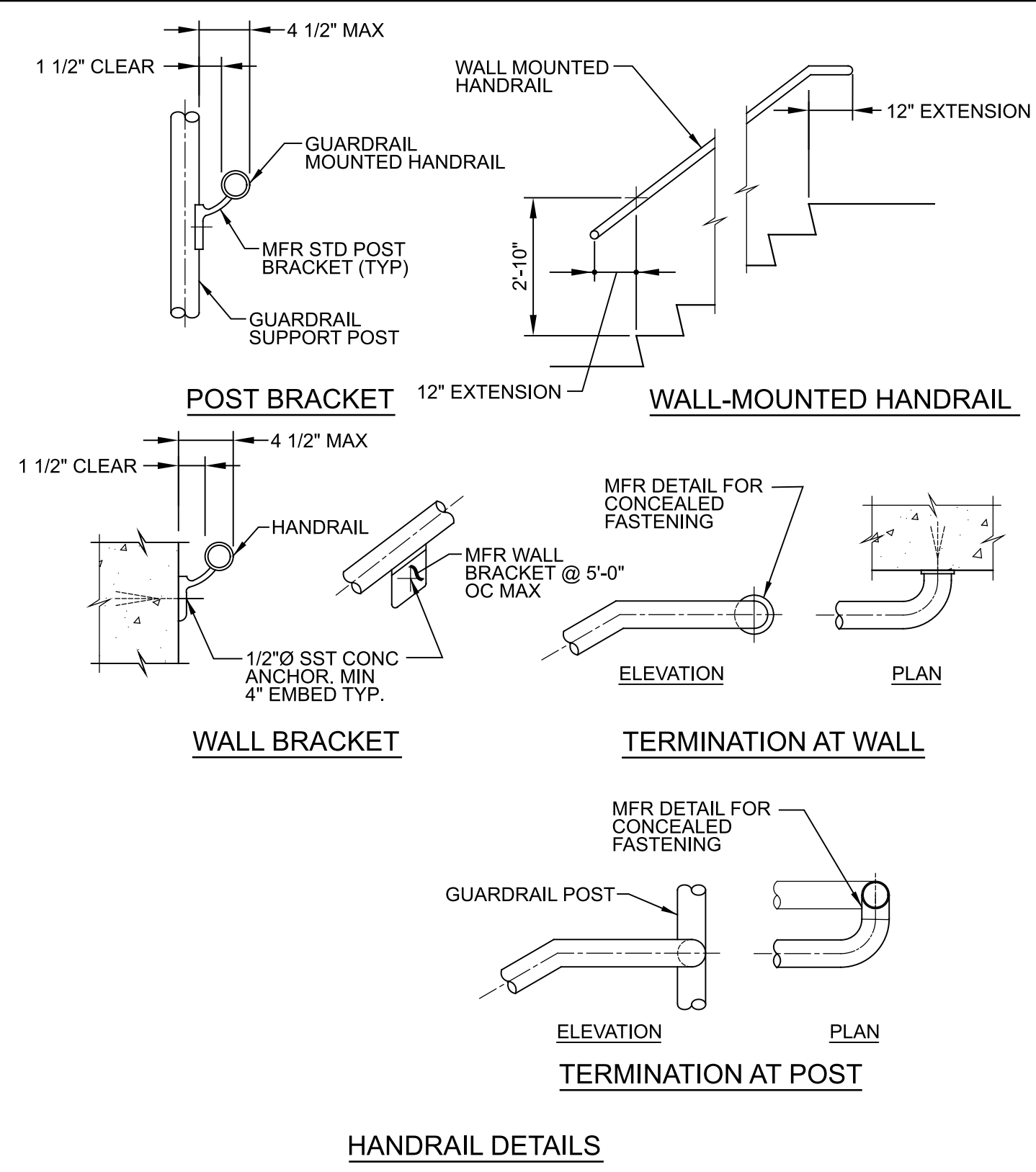


**AC508** GUARDRAIL - PICKET  
TYP NS SHEET 1 OF 3

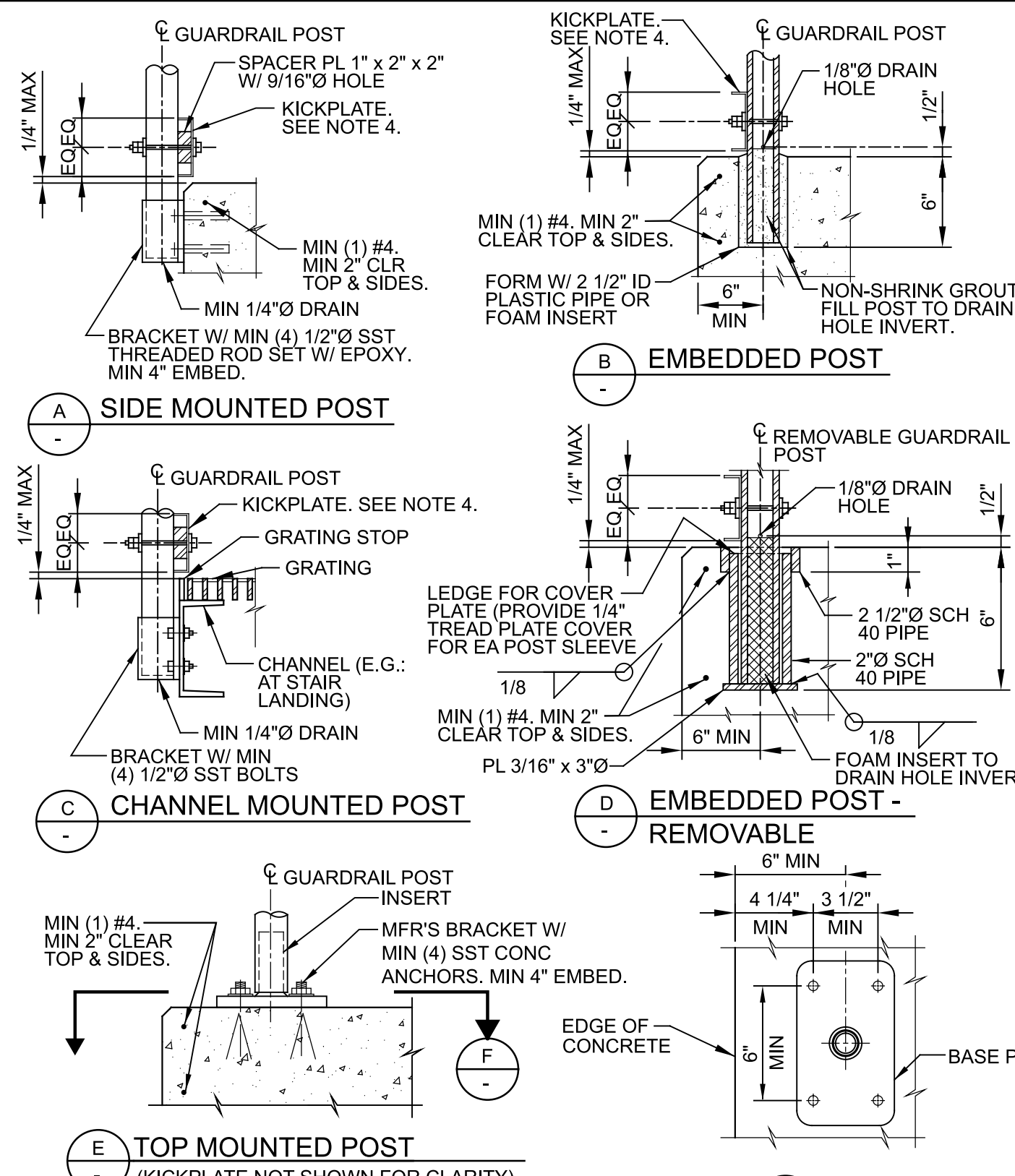


- NOTES:**
- THIS DETAIL IS APPLICABLE AT STAIRS USED BY THE PUBLIC OR BY EMPLOYEES WHO MAY HAVE DISABILITIES. DETAILS AND INSTALLATION SHALL COMPLY WITH THE AMERICANS WITH DISABILITIES ACT, THE BUILDING CODE, AND IN CALIFORNIA TITLE 24.
  - SEE SPECIFICATIONS AND DETAIL AC500/TYP FOR ADDITIONAL REQUIREMENTS.
  - VARIOUS POST MOUNTING DETAILS ARE ILLUSTRATED. SEE DRAWINGS AND DETAIL AC510/TYP FOR SPECIFIC MOUNTING REQUIREMENTS.
  - WHERE THIS DETAIL IS USED, STAIR RISERS SHALL HAVE CLOSED FACES. SEE STAIR TREAD AND RISER DETAILS.
  - HANDRAIL EXTENSIONS ARE REQUIRED ON BOTH SIDES OF STAIR, EXCEPT WHERE INSIDE HANDRAIL IS CONTINUOUS AS AT SWITCHBACK STAIR.
  - AT CURB, USE EMBEDDED OR TOP MOUNTED POST AS INDICATED ON THE DRAWING.

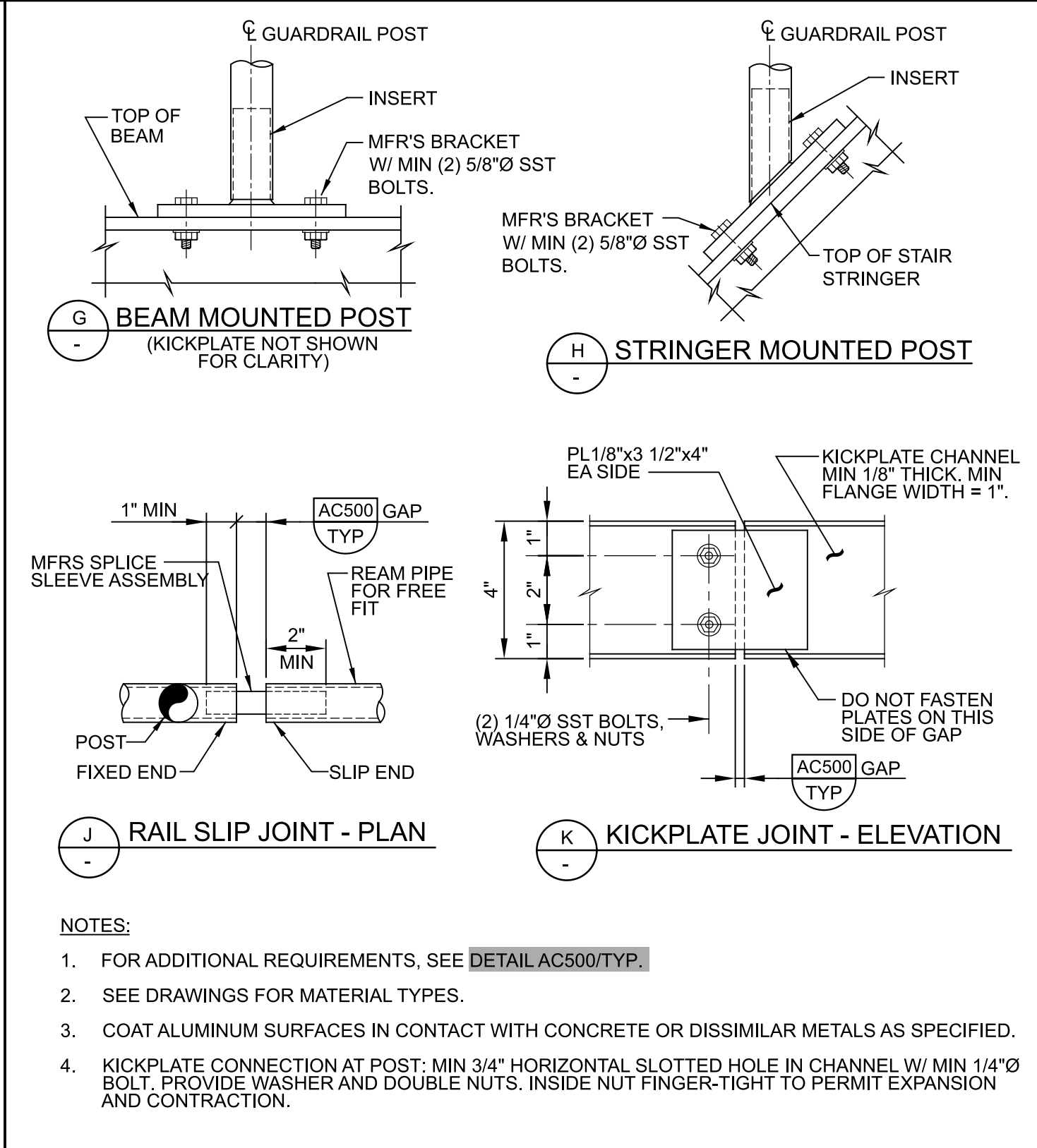
**AC508** GUARDRAIL - PICKET  
TYP NS SHEET 2 OF 3 06/21/19



**AC508** GUARDRAIL - PICKET  
TYP NS SHEET 3 OF 3 06/21/19

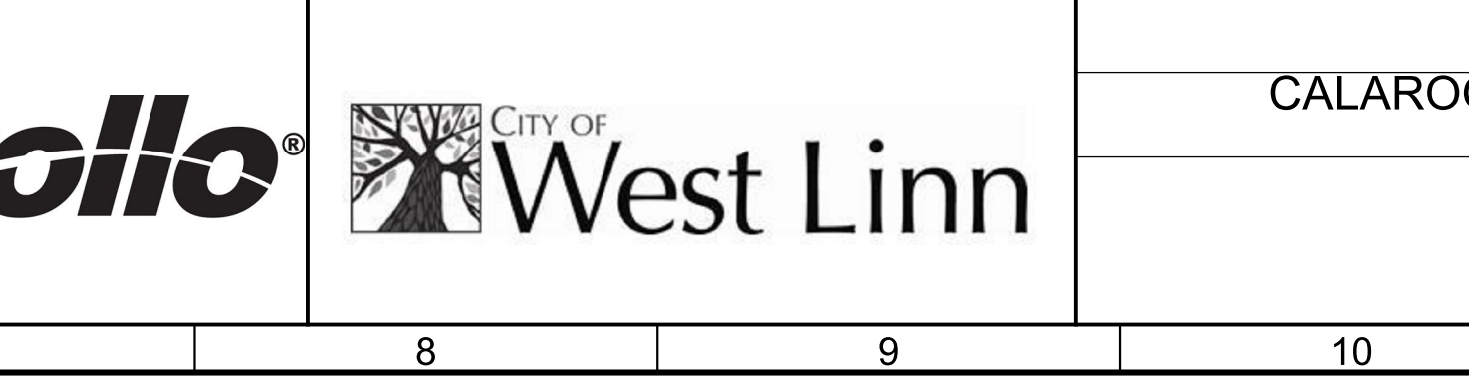
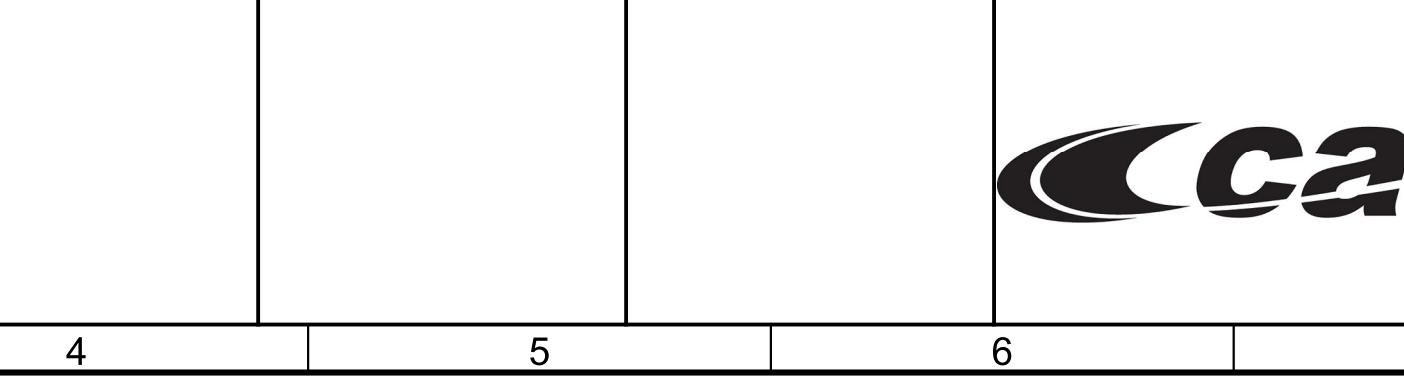


**AC510** GUARDRAIL - MOUNTING  
TYP NS SHEET 1 OF 2 06/21/19



**AC510** GUARDRAIL - MOUNTING  
TYP NS SHEET 2 OF 2 06/21/19

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>				DESIGNED CE
				DRAWN CE
				CHECKED CE
				DATE JULY 2023
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1				
2				
3				



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
TYPICAL

**ARCHITECTURAL 1**

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"	JOB NO. 201779
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	DRAWING NO. <b>TA01</b>
	SHEET NO. X OF XX

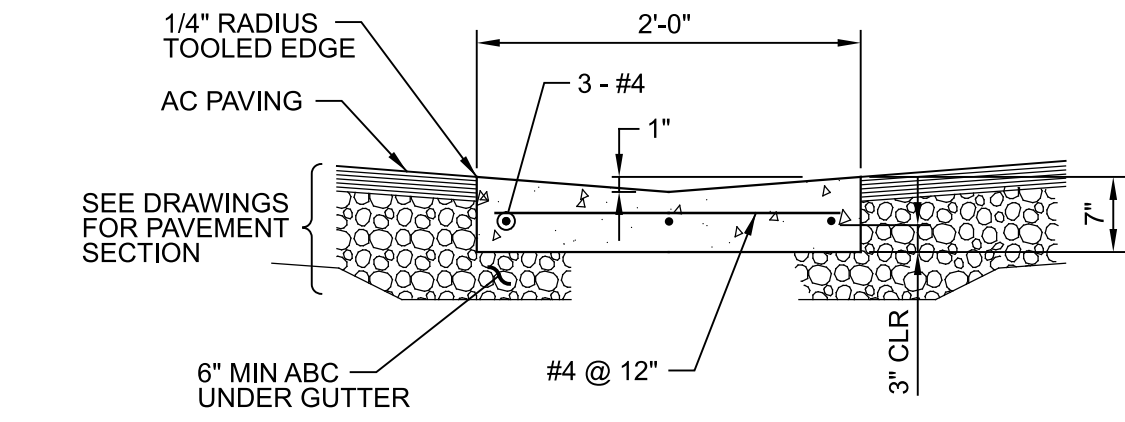
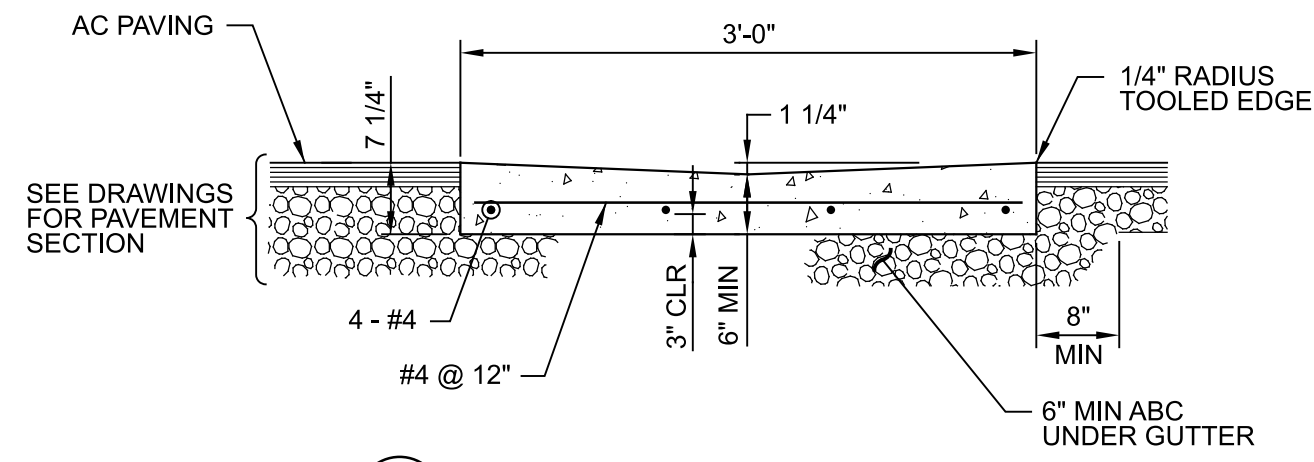


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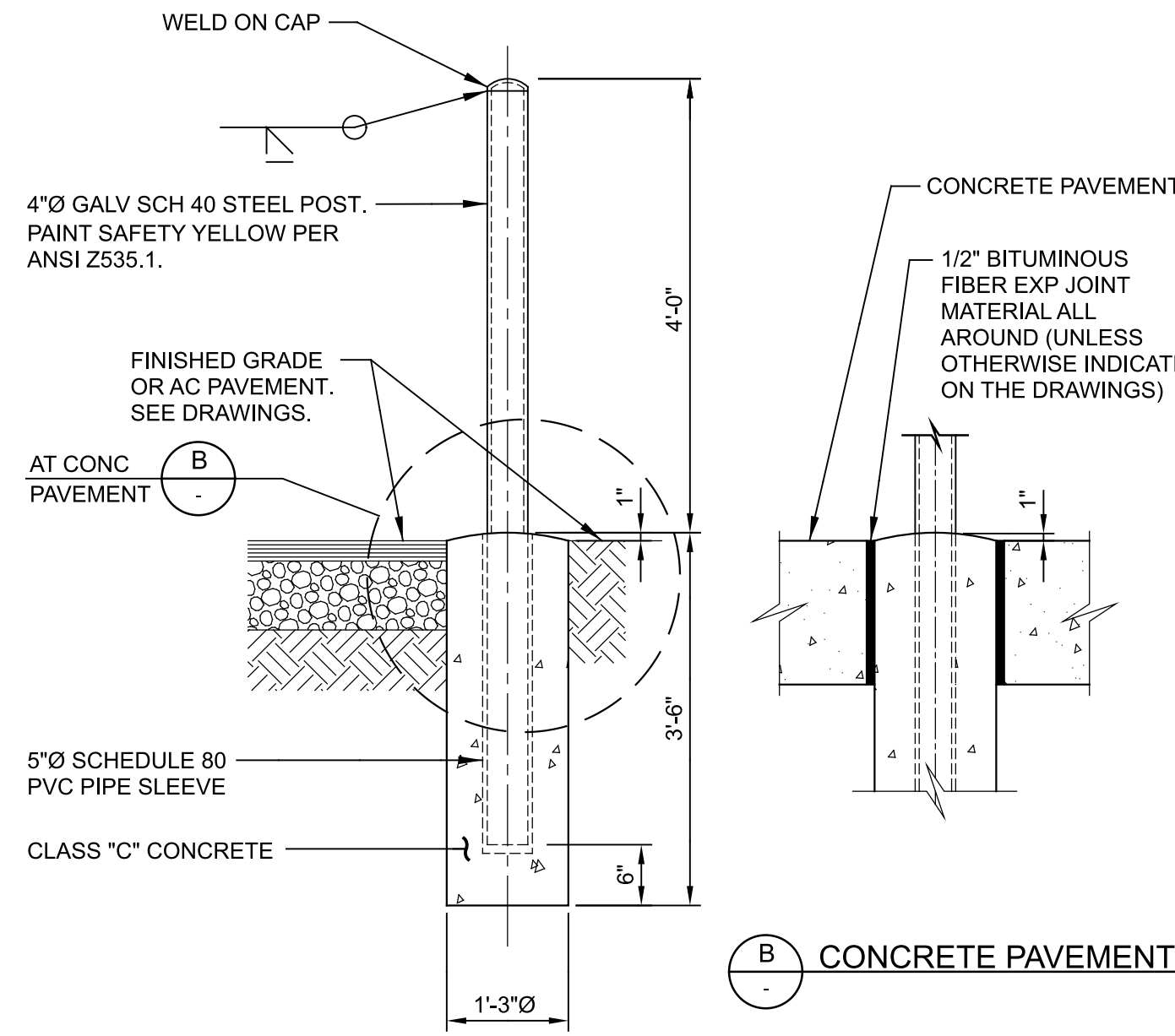
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- NOTES:
1. PROVIDE 3/4" EXPANSION JOINTS AT ENDS OF CONCRETE PLACEMENT, AT POINTS OF CURVATURE, AT INTERSECTIONS, AND AT MAXIMUM SPACING OF 30 FEET. EXPANSION JOINTS SHALL BE 3/4" WIDE WITH 1/4" RADIUS CONCRETE EDGES AT BOTH SIDES OF JOINT. USE BITUMINOUS FIBER EXPANSION JOINT MATERIAL.
  2. DO NOT PASS REINFORCING BARS THROUGH EXPANSION JOINTS.
  3. PROVIDE WEAKENED PLANE JOINTS AT 10 FEET OC MAXIMUM. AT FRONT, TOP AND BACK FACES, PROVIDE 1/2" RADIUS EDGE EACH SIDE AT JOINTS.

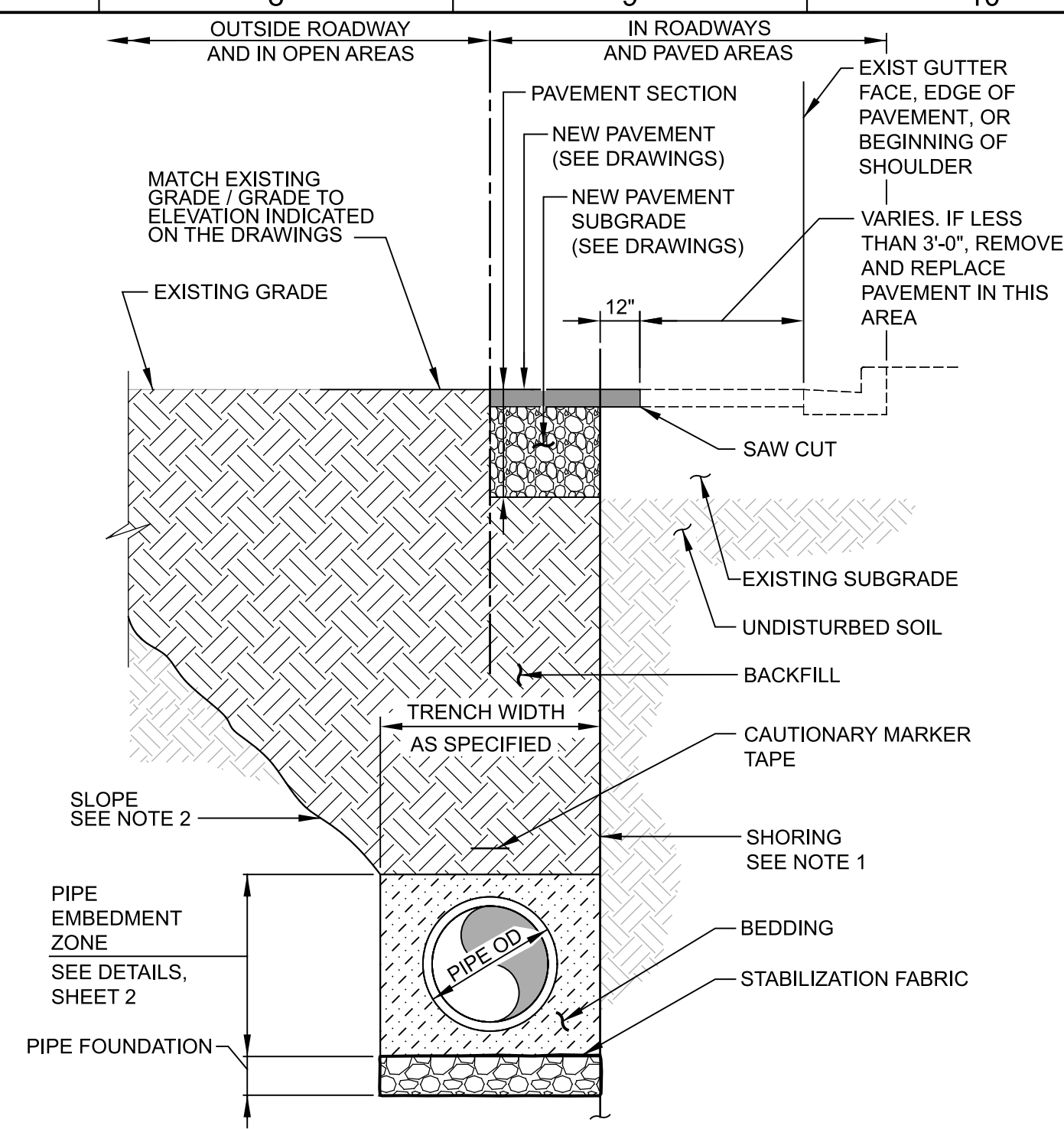
**CR110** GUTTER - CROSS AND VALLEY  
TYP

12/29/2020



**CF161** GUARD POST - REMOVABLE  
TYP

12/29/2020

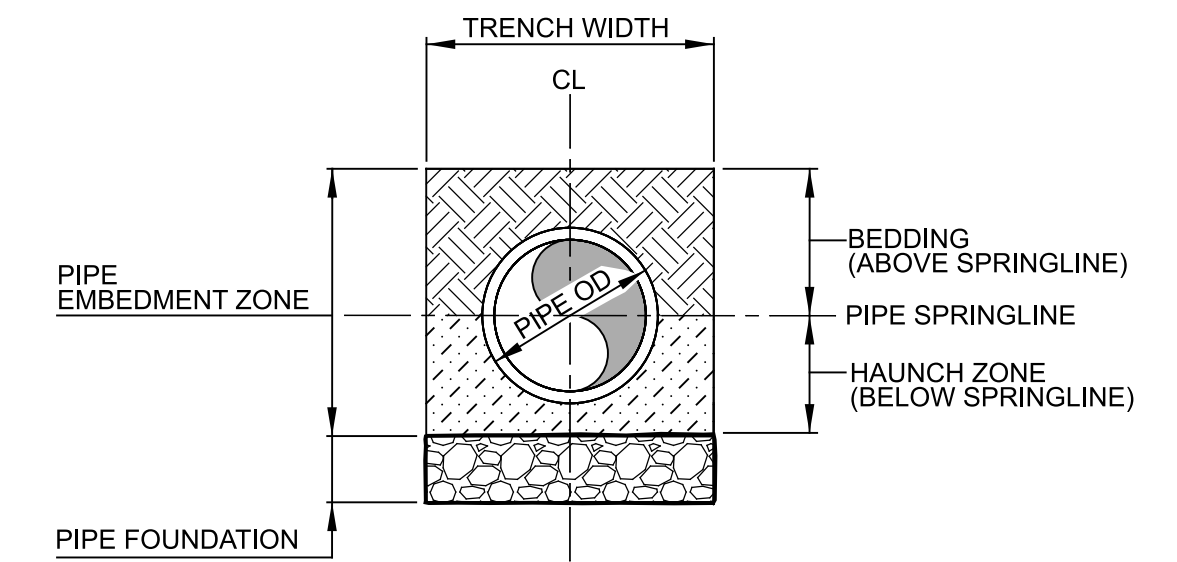


- NOTES:
1. SEE SPECIFICATIONS FOR SHORING REQUIREMENTS.
  2. SEE SPECIFICATIONS FOR SLOPE REQUIREMENTS.
  3. SEE SPECIFICATIONS FOR DEPTH AND WIDTH REQUIREMENTS.

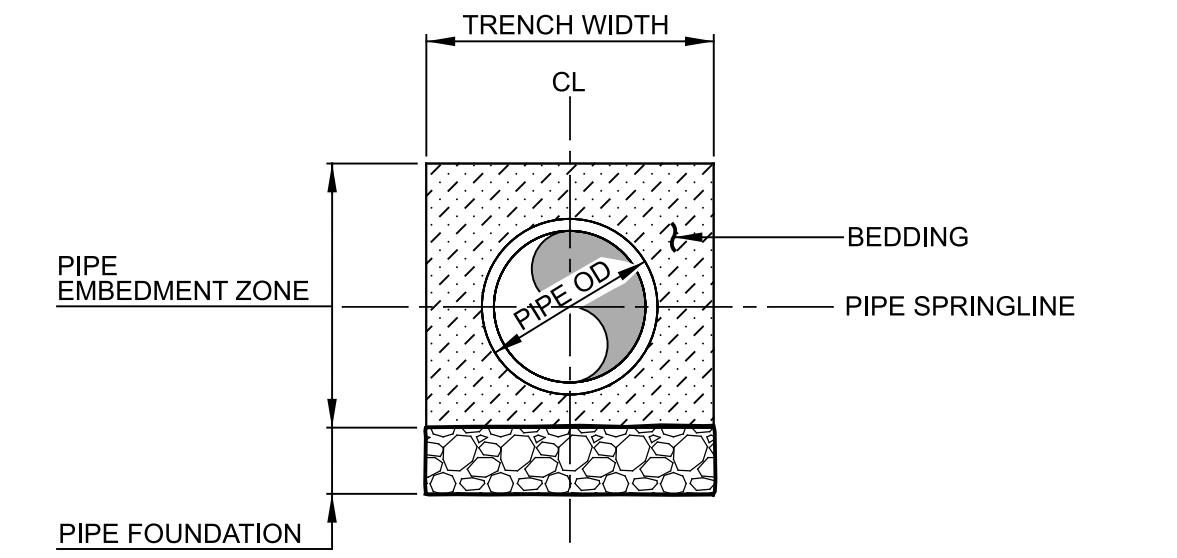
**CY111** PIPE TRENCH  
TYP

SHEET 1 OF 2

08/19/22



**A** PIPE ZONE EMBEDMENT - RIGID PIPE



**B** PIPE ZONE EMBEDMENT - FLEXIBLE PIPE

**CY111** PIPE TRENCH  
TYP

SHEET 2 OF 2

08/19/22

<b>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED	CE		
DRAWN	CE		
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DATE	JULY 2023		
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CHECKED	CE		
DATE	JULY 2023		



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
TYPICAL

CIVIL 2

VERIFY SCALES  
BAR IS ONE INCH ON ORIGINAL DRAWING  
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

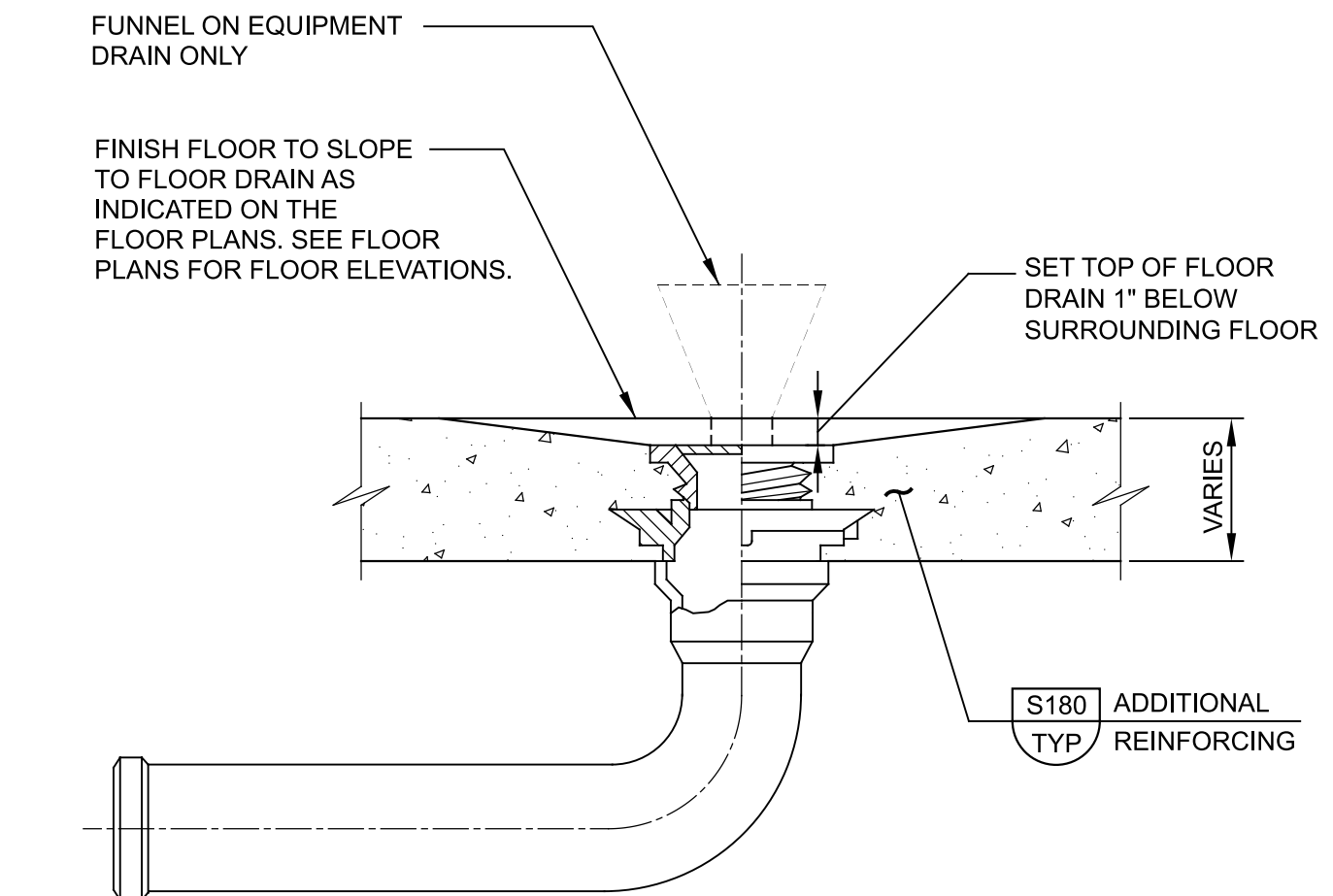
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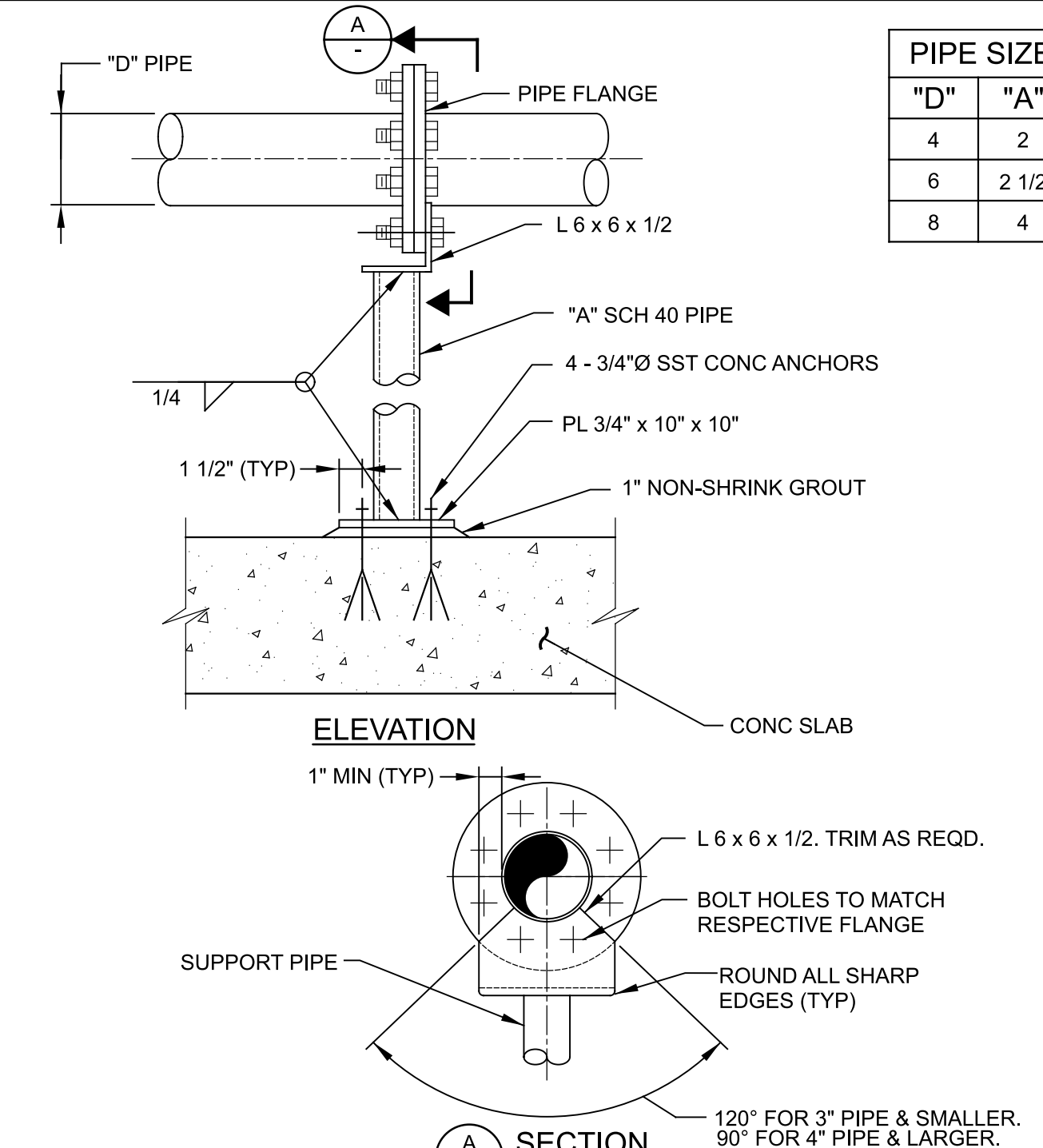
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NOTE:  
1. PROVIDE 12" RADIUS SLOPE TO EQUIPMENT DRAINS WHERE FLOOR DOES NOT SLOPE TO DRAIN.

**MA203** DRAIN - FLOOR OR EQUIPMENT DRAIN W/O TRAP  
TYP  
12/01/22

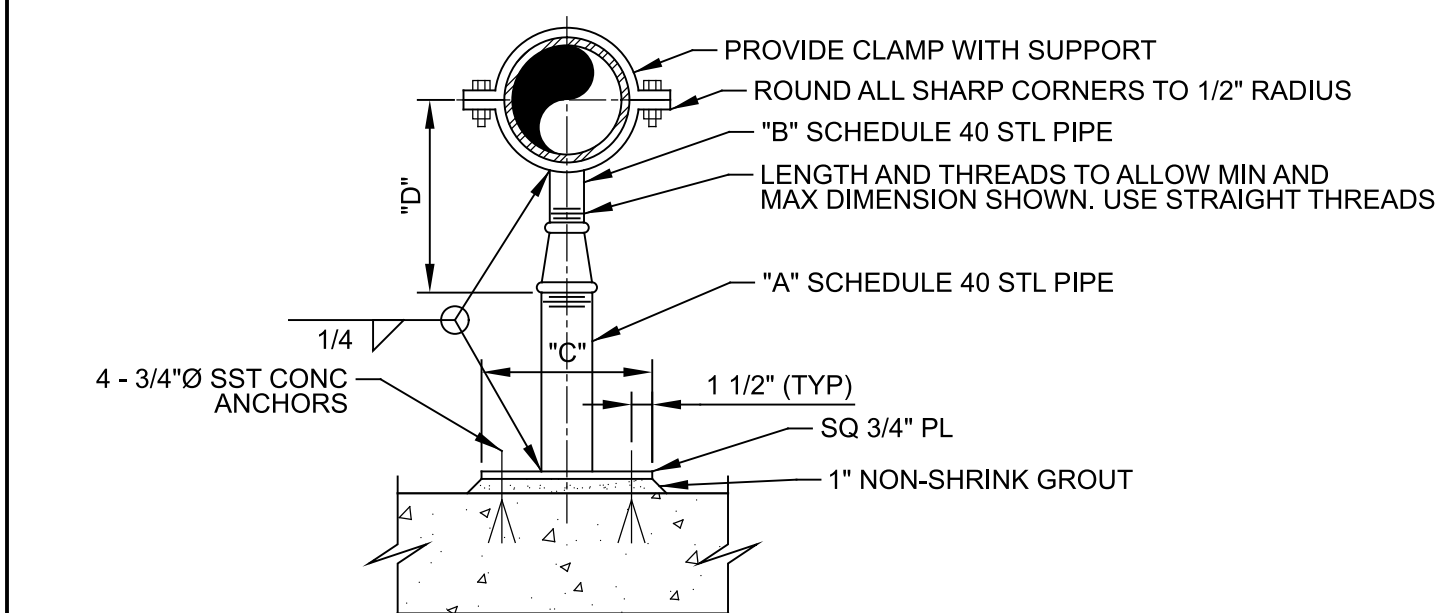


NOTE:  
1. IF SUPPORT IS SUBMERGED OR LOCATED BELOW THE TOP OF WALL IN WATER BEARING STRUCTURE, ALL MATERIAL FOR SUPPORT SHALL BE STAINLESS STEEL. IN ALL OTHER AREAS, ALL MATERIAL FOR SUPPORT SHALL BE HOT-DIP GALVANIZED STEEL UNLESS OTHERWISE INDICATED ON DRAWINGS. HOT-DIP GALVANIZE AFTER FABRICATION.

**MP032** PIPE SUPPORT - POST ON CONCRETE: FIXED HEIGHT STEEL W/ TOP CONNECTION TO PIPE FLANGE  
TYP  
NS  
12/01/22

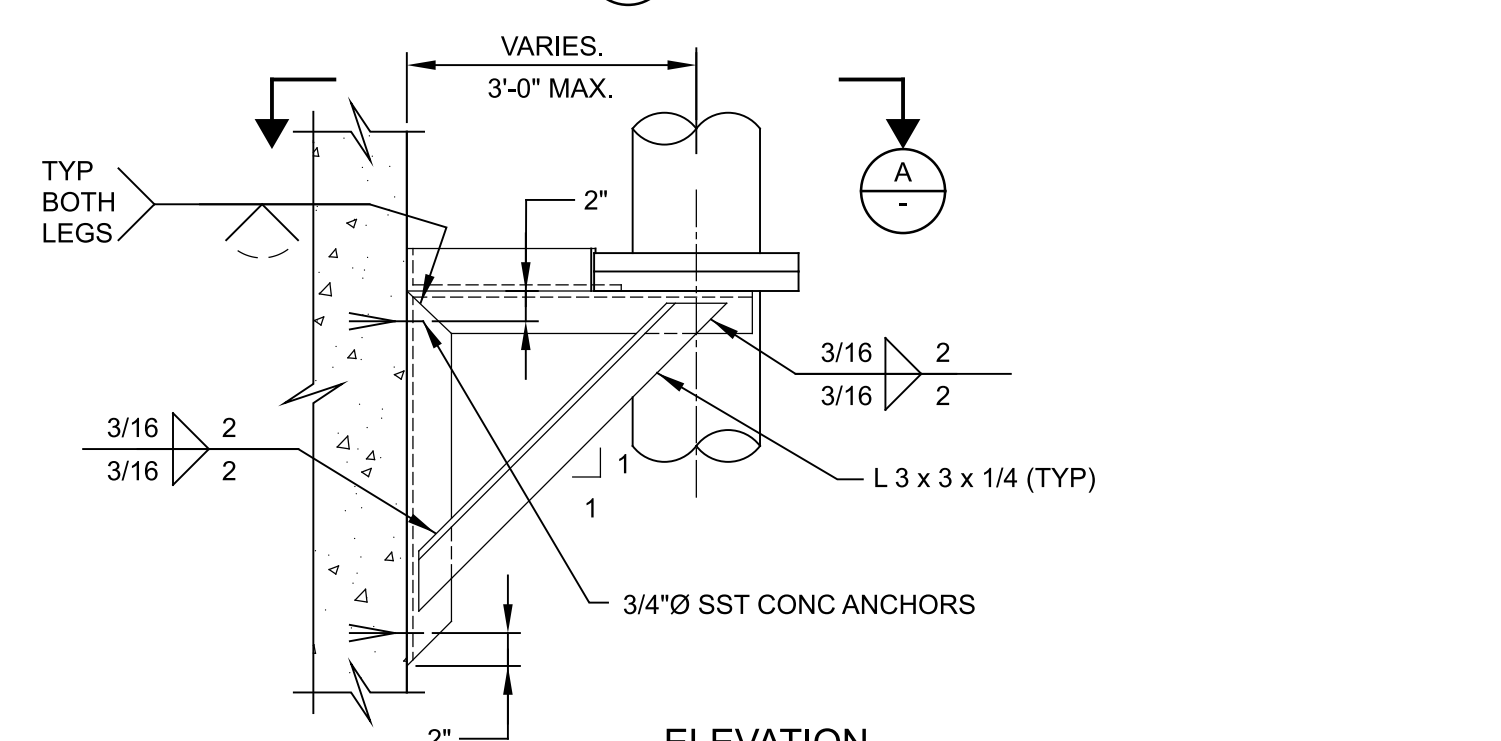
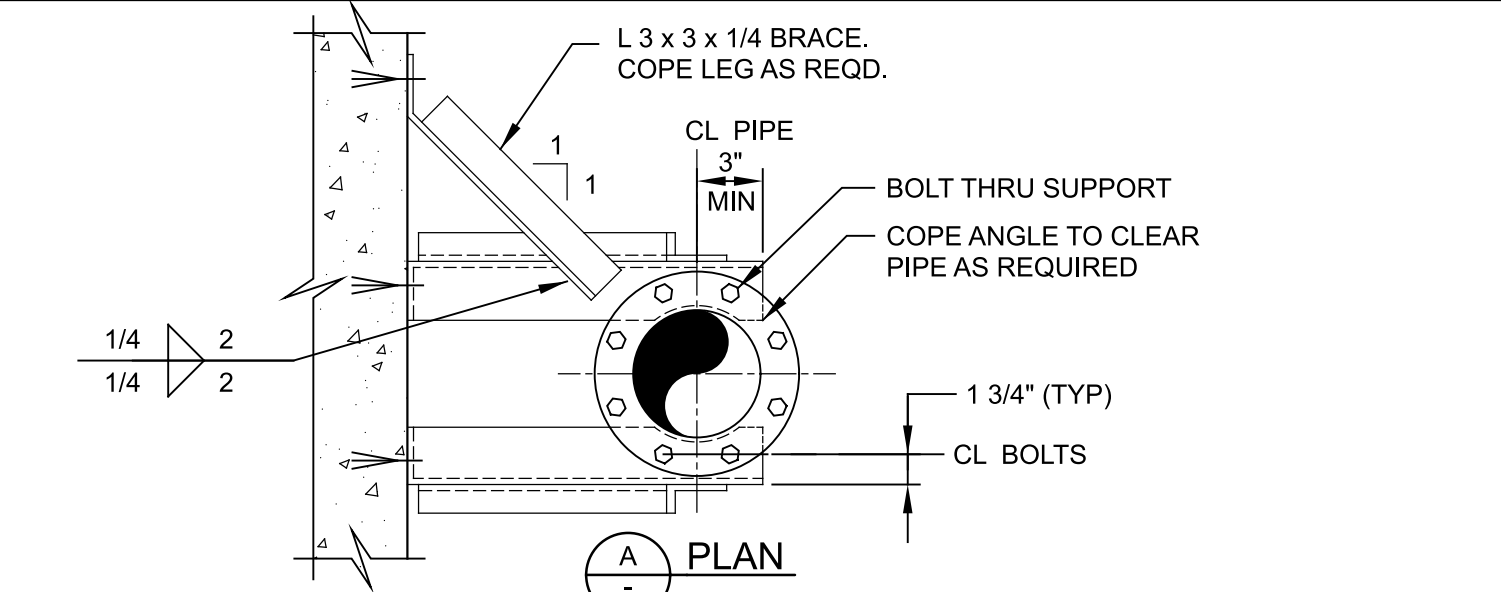
ADJUSTABLE PIPE SADDLE SUPPORT SCHEDULE (INCHES)

SIZE OF SUPPORTED PIPE **	PIPE SIZE "A"	PIPE SIZE "B"	"C"	"D"	
				MINIMUM	MAXIMUM
2 1/2 *	2 1/2	1 1/2	12	8	13
3	2 1/2	1 1/2	12	8 1/2	13 1/2
3 1/2	2 1/2	1 1/2	12	8 1/2	13 1/2
4	3	2 1/2	12	9 1/2	14
6	3	2 1/2	12	10 1/2	15 1/2
8	3	2 1/2	12	11 1/2	16 1/2
10	3	2 1/2	12	13 1/2	18 1/2
12	3	2 1/2	12	15	19 1/2
14	4	3	12	16 1/2	20 1/2
16	4	3	12	17 1/2	22 1/2
18	6	3 1/2	14	19 1/2	24
20	6	3 1/2	14	21	25 1/2
24	6	4	14	23 1/2	28 1/2
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36	6	4	14	30 1/2	34 1/2



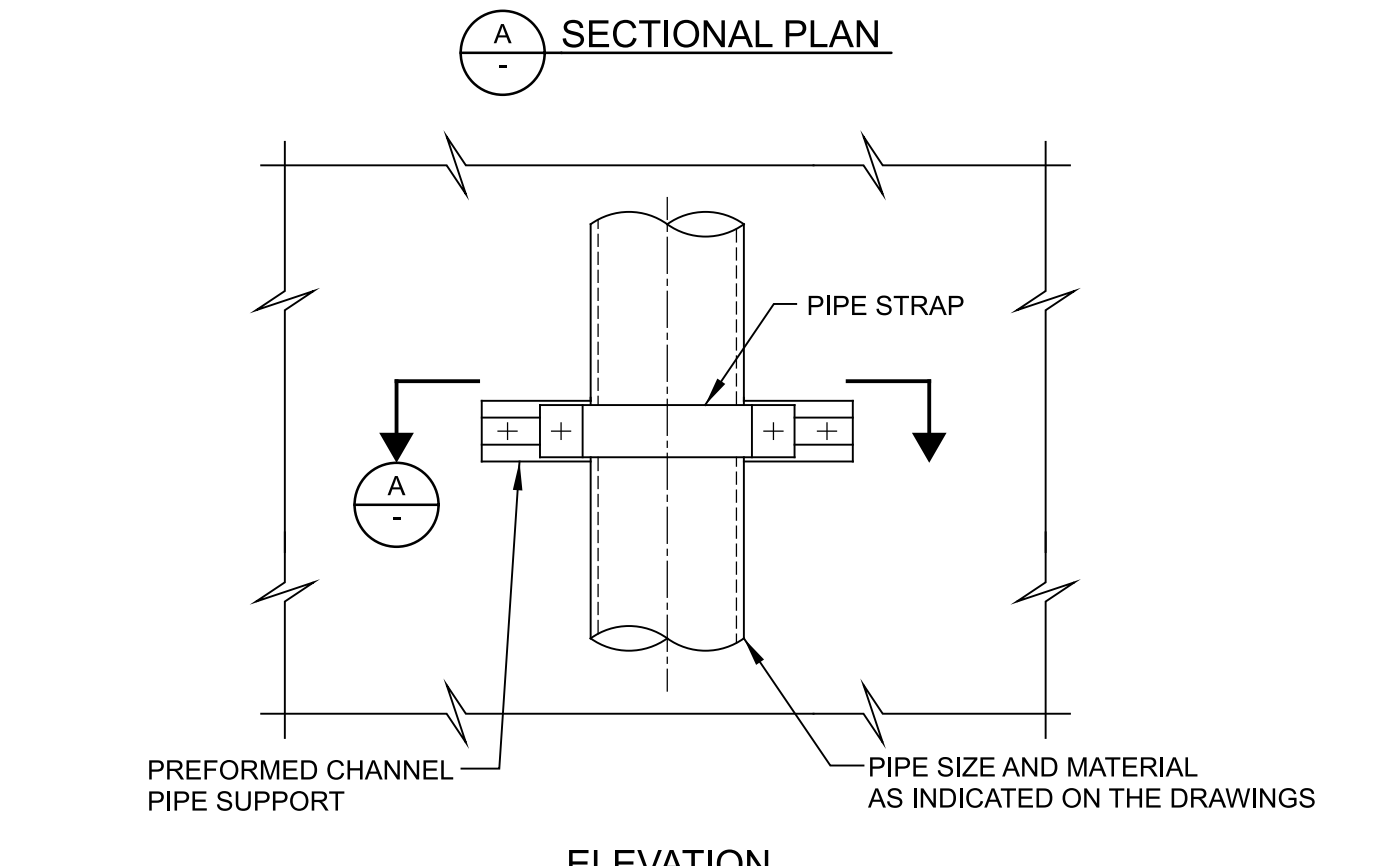
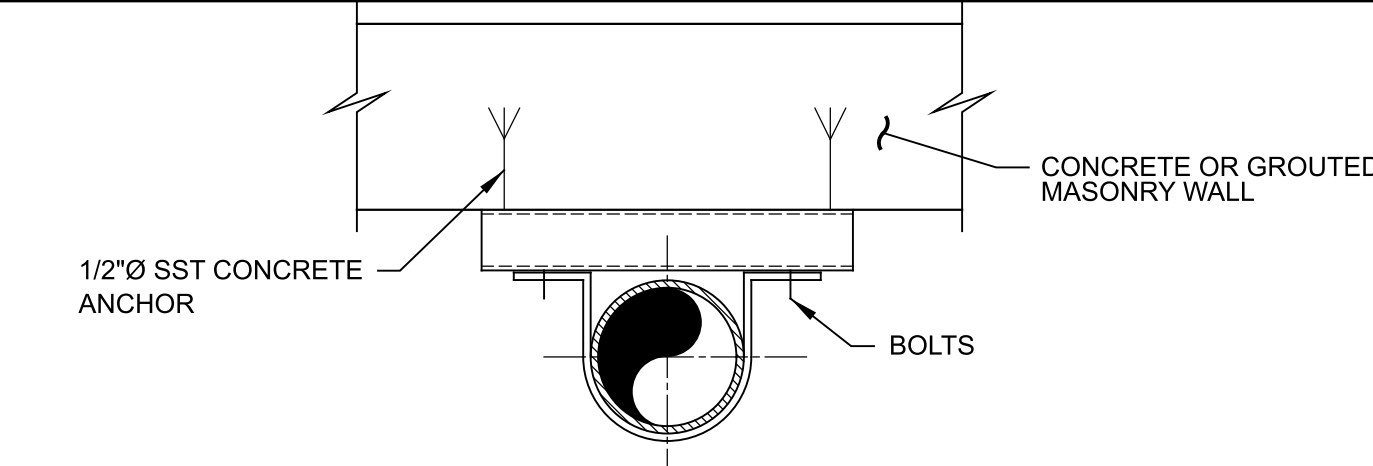
NOTES:  
1. HOT-DIP GALVANIZED SUPPORT AFTER FABRICATION.  
2. \* = USE 2 1/2" SUPPORTS FOR PIPES LESS THEN 2 1/2".  
3. \*\* = NOMINAL PIPE SIZE.

**MP034** PIPE SUPPORT - POST ON CONCRETE: ADJUSTABLE HEIGHT STEEL W/ TOP SADDLE  
TYP  
NS  
12/01/22



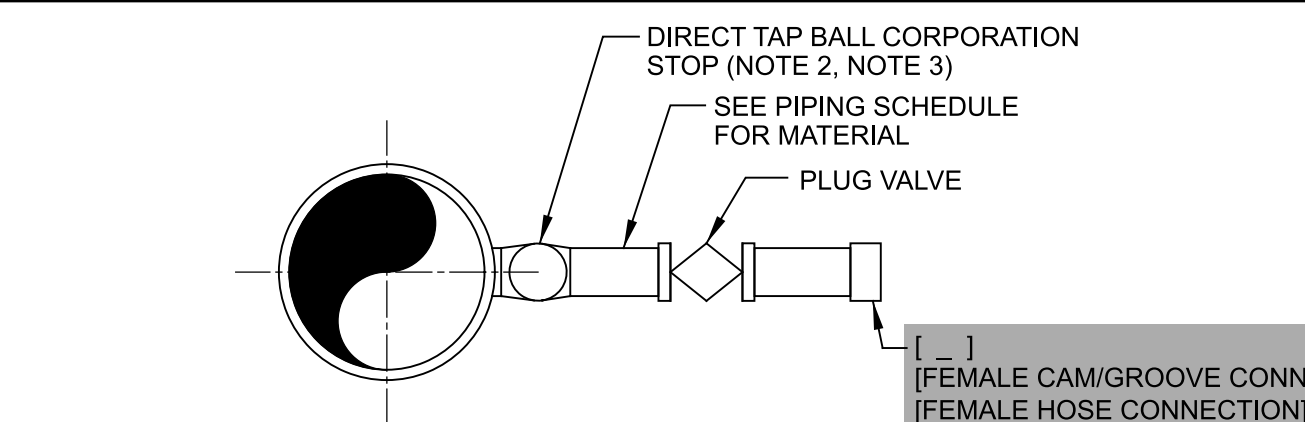
NOTE:  
1. HOT-DIP GALVANIZE SUPPORT AFTER FABRICATION.

**MP250** PIPE SUPPORT - WALL - VERTICAL PIPE ON FABRICATED SUPPORT AT FLANGES  
TYP  
N  
12/01/22

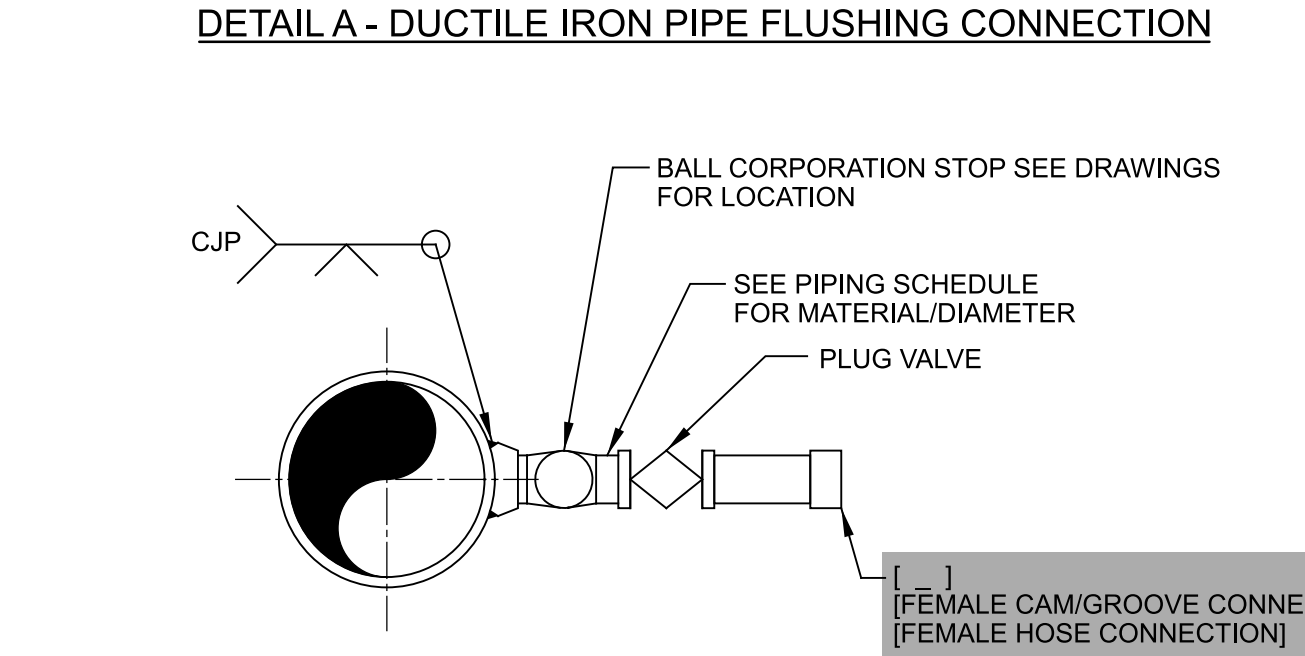


NOTE:  
1. IF SUPPORT IS SUBMERGED OR LOCATED BELOW THE TOP OF WALL IN WATER BEARING STRUCTURE, ALL MATERIAL SHALL BE STAINLESS STEEL. IN ALL OTHER AREAS, THE MATERIALS SHALL BE HOT-DIP GALVANIZED STEEL UNLESS OTHERWISE INDICATED ON THE DRAWINGS. HOT-DIP GALVANIZE AFTER FABRICATION.

**MP253** PIPE SUPPORT - OVERHEAD PREFORMED CHANNEL: SURFACE MOUNTED  
TYP  
12/01/22



DIP NOMINAL DIAMETER	FLUSHING CONNECTION DIAMETER
4"	3/4"
6" - 14"	1"
16"	1 1/2"
18" AND ABOVE	2"



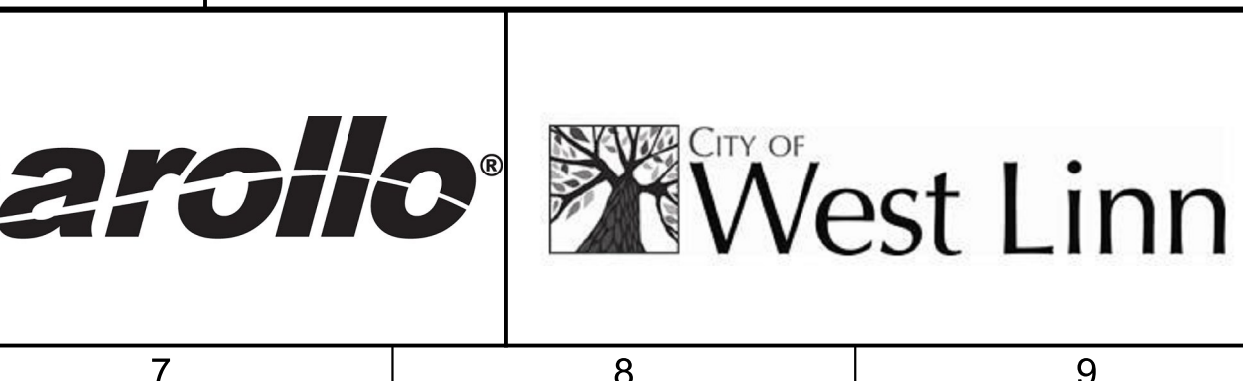
NOTE:  
1. CJP = COMPLETE JOINT PENETRATION.  
2. CORPORATION STOP SHALL BE FURNISHED WITH AWWA TAPER THREADS PER AWWA C800. PIPE SHALL BE TAPPED ACCORDINGLY.  
3. CONNECTIONS GREATER THAN 2" SHALL REQUIRE A TAPPING SADDLE.

**MP405** PIPE CONNECTION - FLUSHING  
TYP  
12/01/22

**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

REV	DATE	BY	DESCRIPTION
1			
2			
3			

DESIGNED CE
DRAWN CE
CHECKED CE
DATE JULY 2023



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
TYPICAL

MECHANICAL 1

VERIFY SCALES  
BAR IS ONE INCH ON ORIGINAL DRAWING  
0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
DRAWING NO. TM01  
SHEET NO. X OF XX



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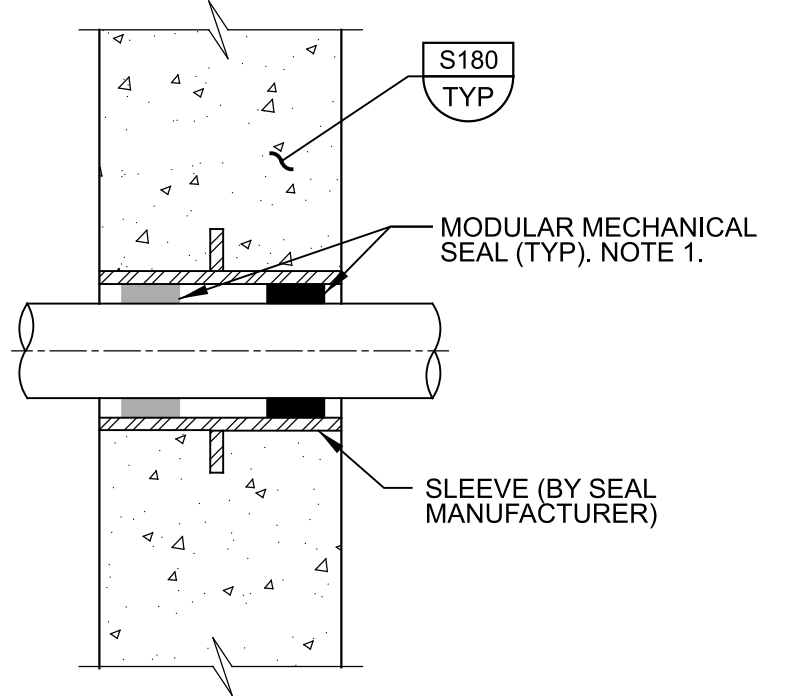
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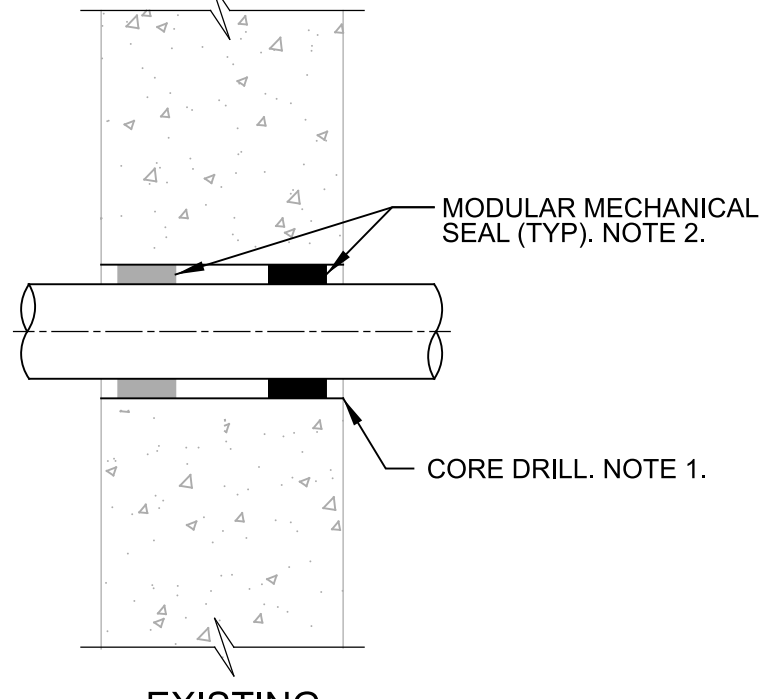
1 2 3 4 5 6 7 8 9 10 11 12 13

A  
B  
C

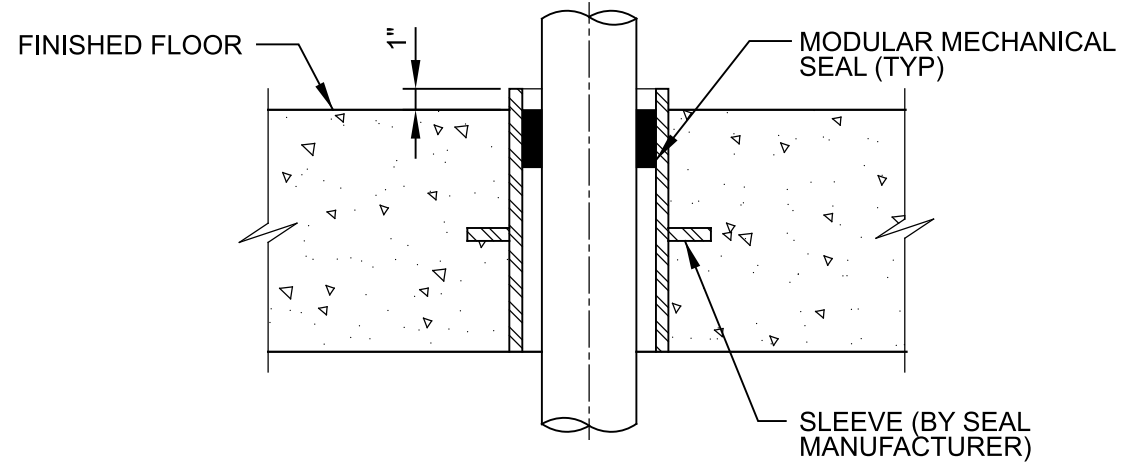
A  
B  
C



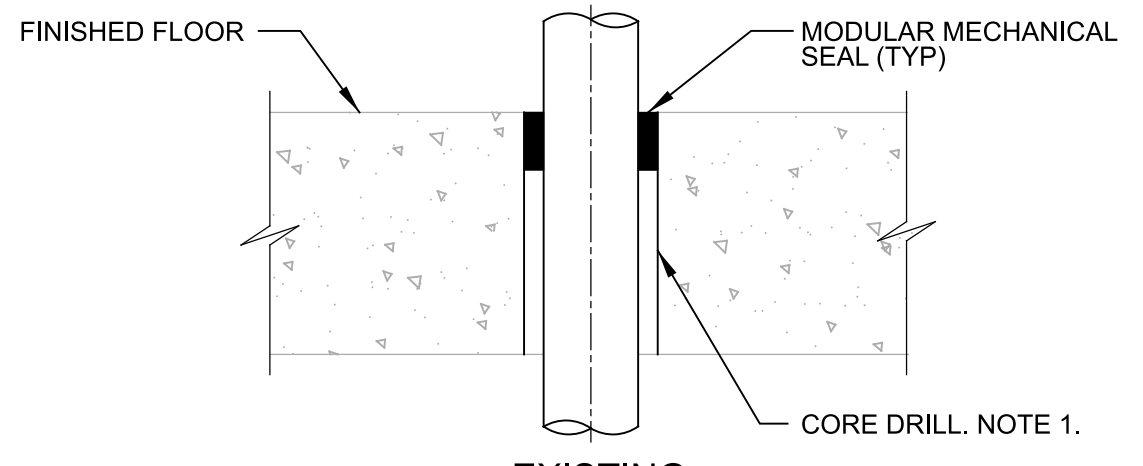
NEW WALL PENETRATION



EXISTING WALL PENETRATION



NEW SLAB PENETRATION



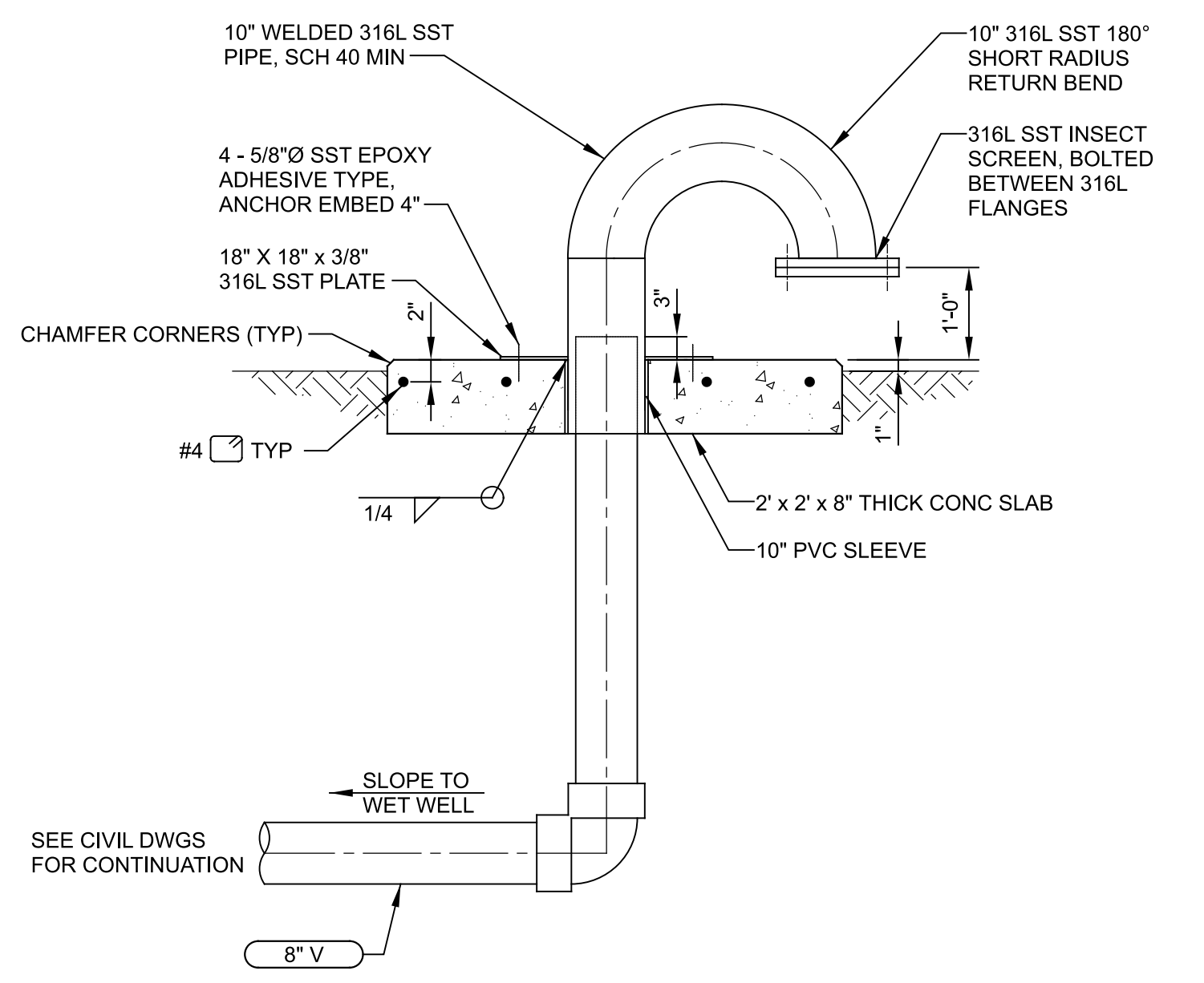
EXISTING SLAB PENETRATION

- NOTES:
1. WALLS THICKER THAN 12" INSTALL MODULAR MECHANICAL SEAL AT BOTH ENDS OF WALL SLEEVE.

- NOTES:
1. CORE DRILL DIAMETER, PROCEDURES, AND POST-DRILLING SURFACE PREPARATION PER MODULAR MECHANICAL SEAL MANUFACTURER'S RECOMMENDATIONS FOR SPECIFIC PIPE OD.
  2. WALLS 12" OR THICKER INSTALL MODULAR MECHANICAL SEAL AT BOTH ENDS OF PENETRATION.

**MP544** WALL PENETRATION - CAST-IN SLEEVE  
 TYP W/ BARRIER SEALS  
 NS SHEET 1 OF 2 12/01/22

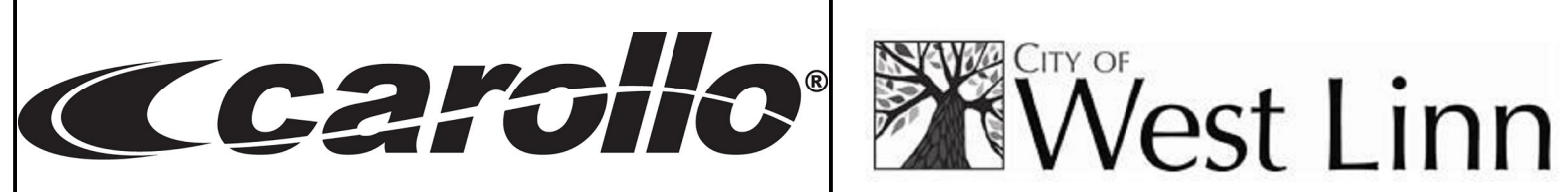
**MP544** WALL PENETRATION - CAST-IN SLEEVE  
 TYP W/ BARRIER SEALS  
 NS SHEET 2 OF 2 12/01/22



**P250** VENT DETAIL  
 TYP J 07/25/23

**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

DESIGNED CE  
 DRAWN CE  
 CHECKED CE  
 DATE JULY 2023



CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 TYPICAL

VERIFY SCALES  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
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 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
 DRAWING NO. TM01  
 SHEET NO. X OF XX

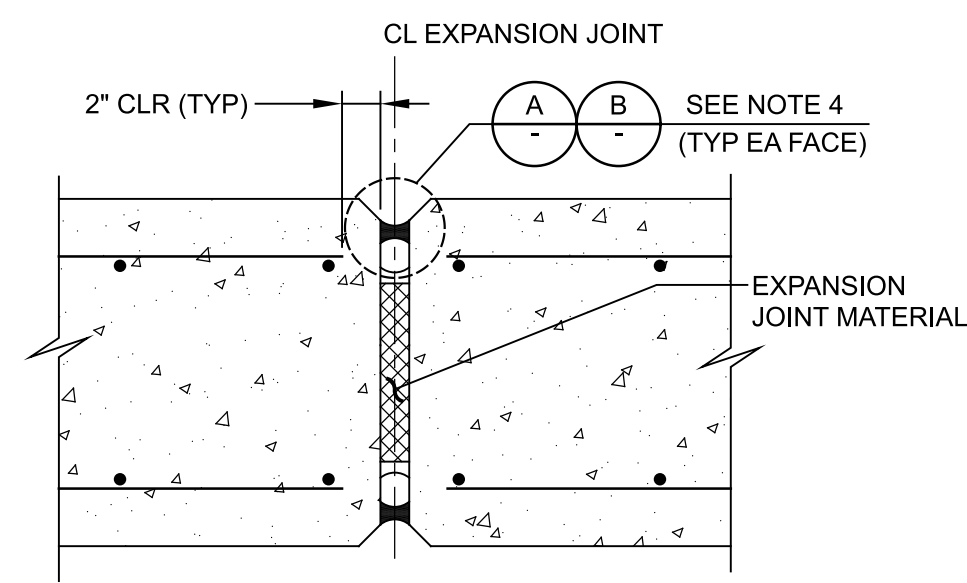
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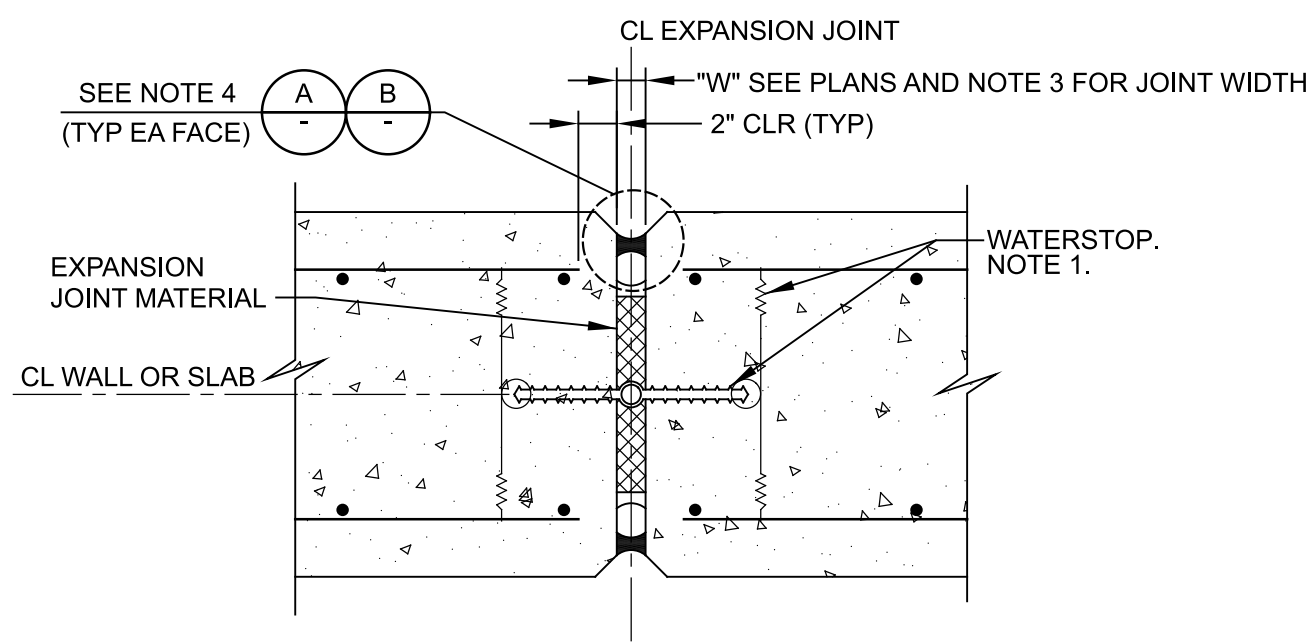
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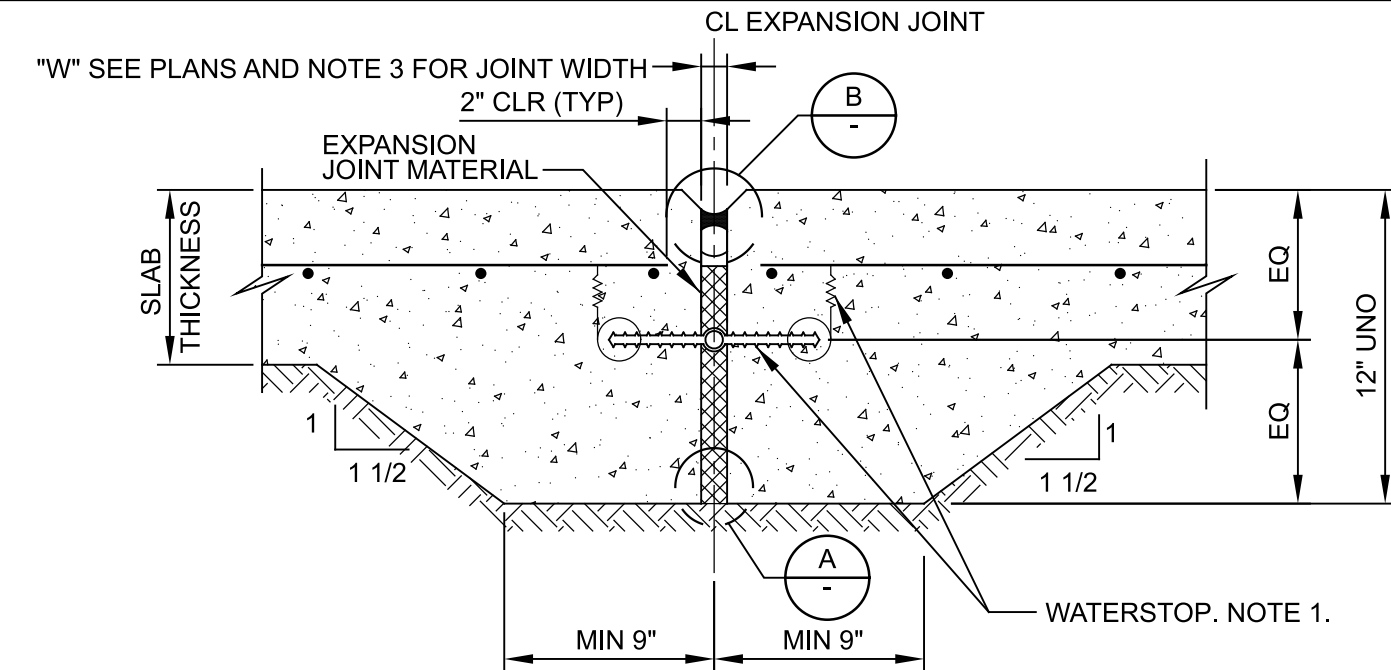
NON-WATER BEARING SLAB OR WALL



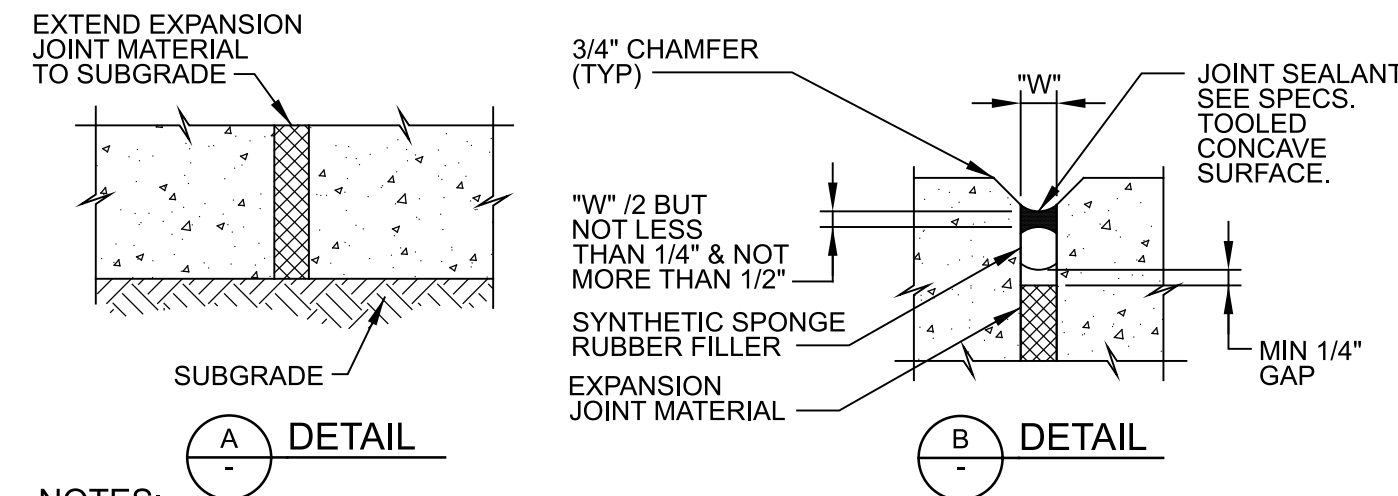
WATER BEARING SLAB OR WALL

**S130** EXPANSION JOINT  
TYP

SHEET 1 OF 2 07/22/16



WATER BEARING SLAB LESS THAN 12" THICK

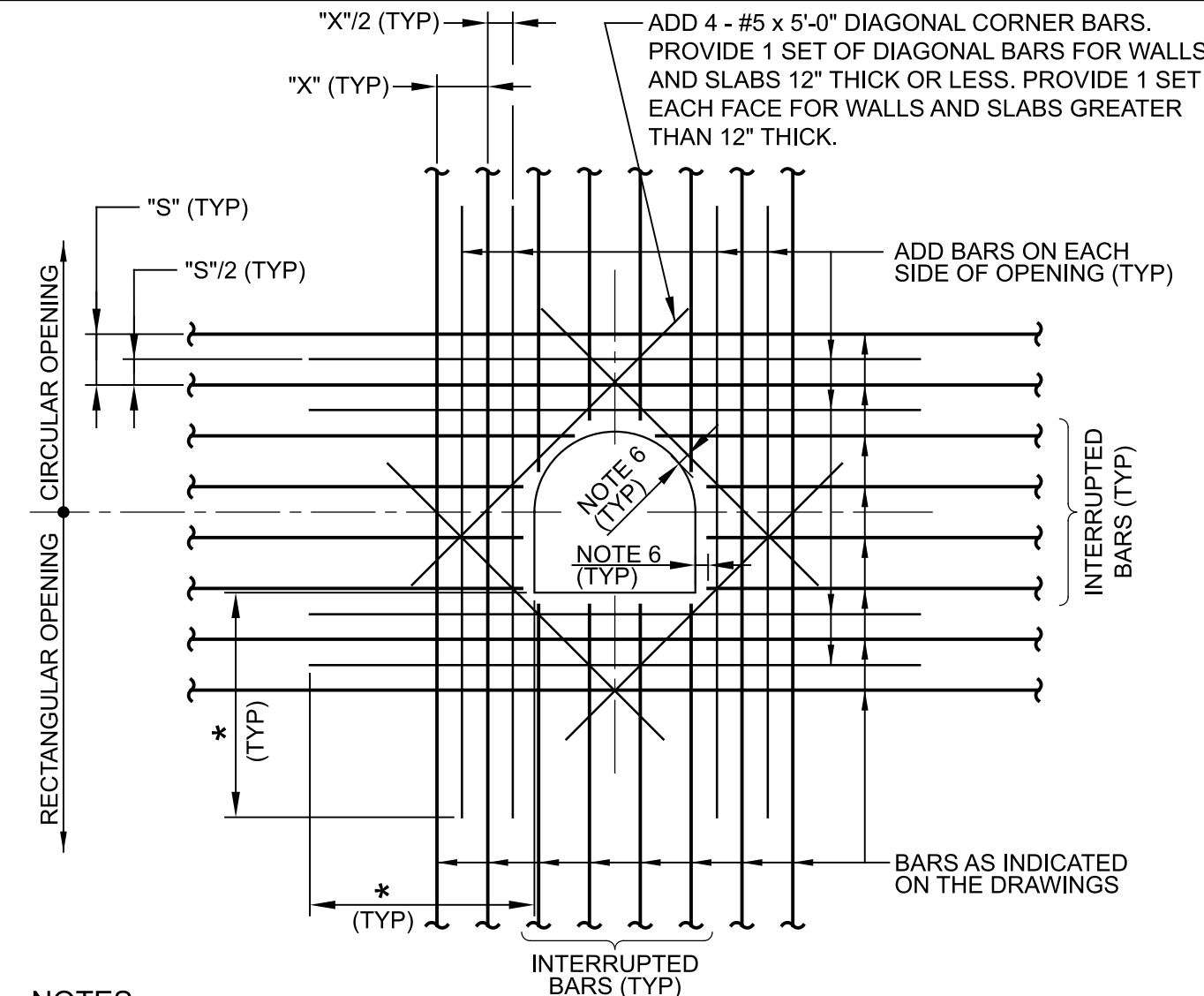


NOTES:

- 9" WATERSTOP WITH CENTER BULB CENTERED ON JOINT - SEE DETAIL S106/TYP. PROVIDE WIRE TIES MAX 2'-0" OC. HOG RINGS MAY BE USED IN LIEU OF WIRE LOOPS. THOROUGHLY CLEAN WATERSTOP BEFORE PLACING CONCRETE IN SECOND POUR.
- JOINT EDGES:  
A. FOR WALLS AND BOTTOM OF EXPOSED SLABS: FORM EDGES WITH 3/4" CHAMFER.  
B. FOR SLABS: EDGE TOP AND ENDS WITH 1/4" RADIUS.
- "W"=1" UNLESS OTHERWISE INDICATED ON PLANS. (MIN JOINT WIDTH = 3/8". MAX JOINT WIDTH = 2")
- USE DETAIL A ONLY AT SOIL SIDE OF SLABS ON GRADE. USE DETAIL B AT ALL OTHER LOCATIONS.

**S130** EXPANSION JOINT  
TYP

SHEET 2 OF 2 07/22/16

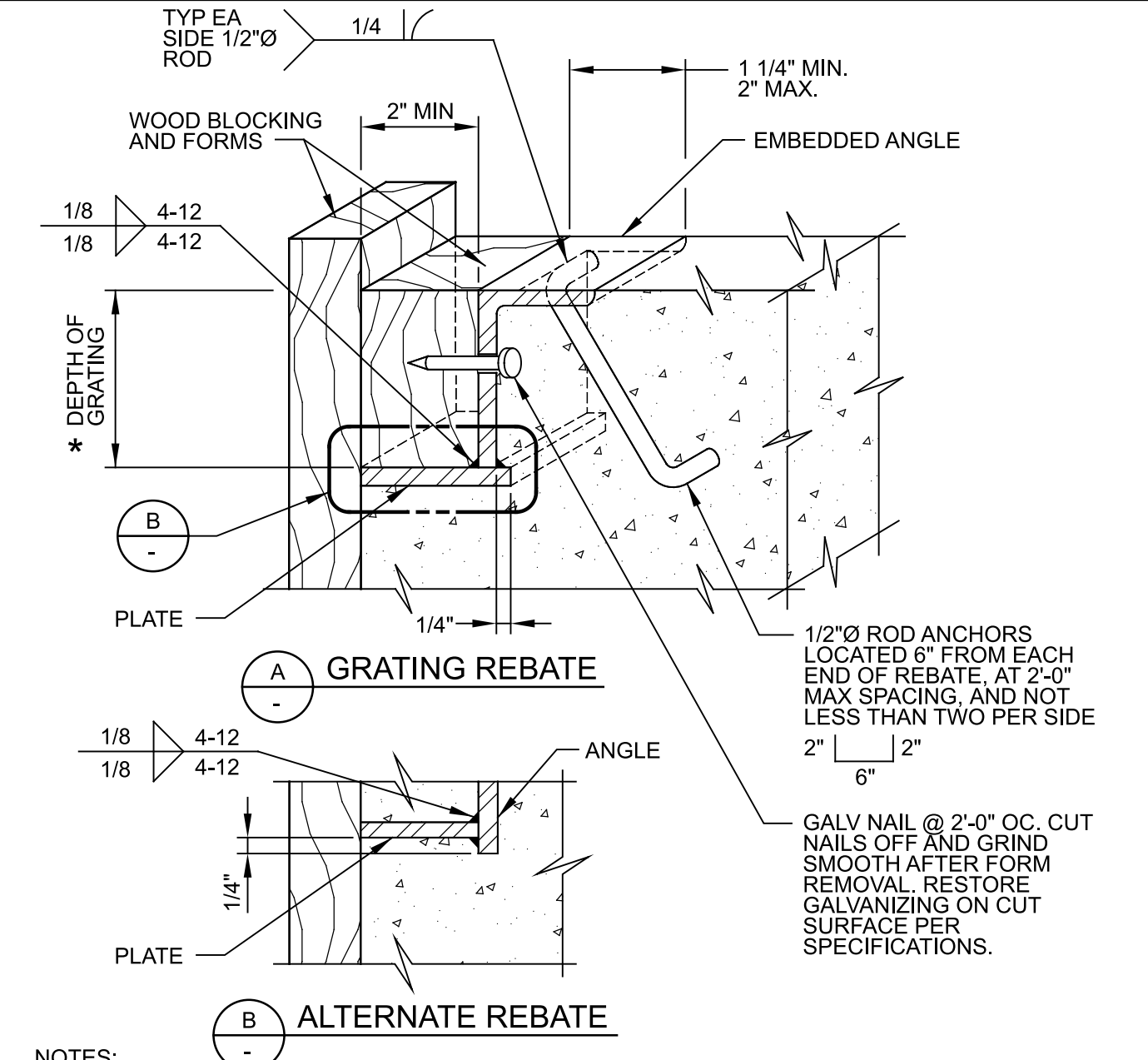


NOTES:

- AREA OF ADD BARS AT EACH EDGE OF OPENING IN EACH DIRECTION SHALL BE EQUAL TO OR GREATER THAN 1/2 THE CROSS SECTIONAL AREA OF THE INTERRUPTED BARS.
- PROVIDE STANDARD ACI HOOKS ON BARS IF STRAIGHT EXTENSION PAST THE OPENING, CANNOT BE ACHIEVED.
- PLACE ADD BARS IN SAME PLANES AS INTERRUPTED REINFORCING.
- PLACE #5 DIAGONAL BARS ON INSIDE OF INTERRUPTED REINFORCING.
- \* DIMENSION EQUALS OPENING DIMENSION MEASURED PERPENDICULAR TO ADD BARS PLUS LAP SPLICE LENGTH.
- 2" CLEAR TO CONCRETE OPENINGS OR OUTSIDE FACE OF PIPES AND PIPE SLEEVES, DO NOT OVERCUT REINFORCEMENT FOR EASIER PLACEMENT OF WEEP RINGS AND FLANGES.
- ADD BARS ARE NOT REQUIRED AT SIDES OF OPENINGS PARALLEL TO AND WITHIN 6" OF A WALL OR BEAM.

**S180** ADDITIONAL REINFORCING AT OPENINGS IN CONCRETE SLABS OR WALLS  
TYP

S, N 03/12/19

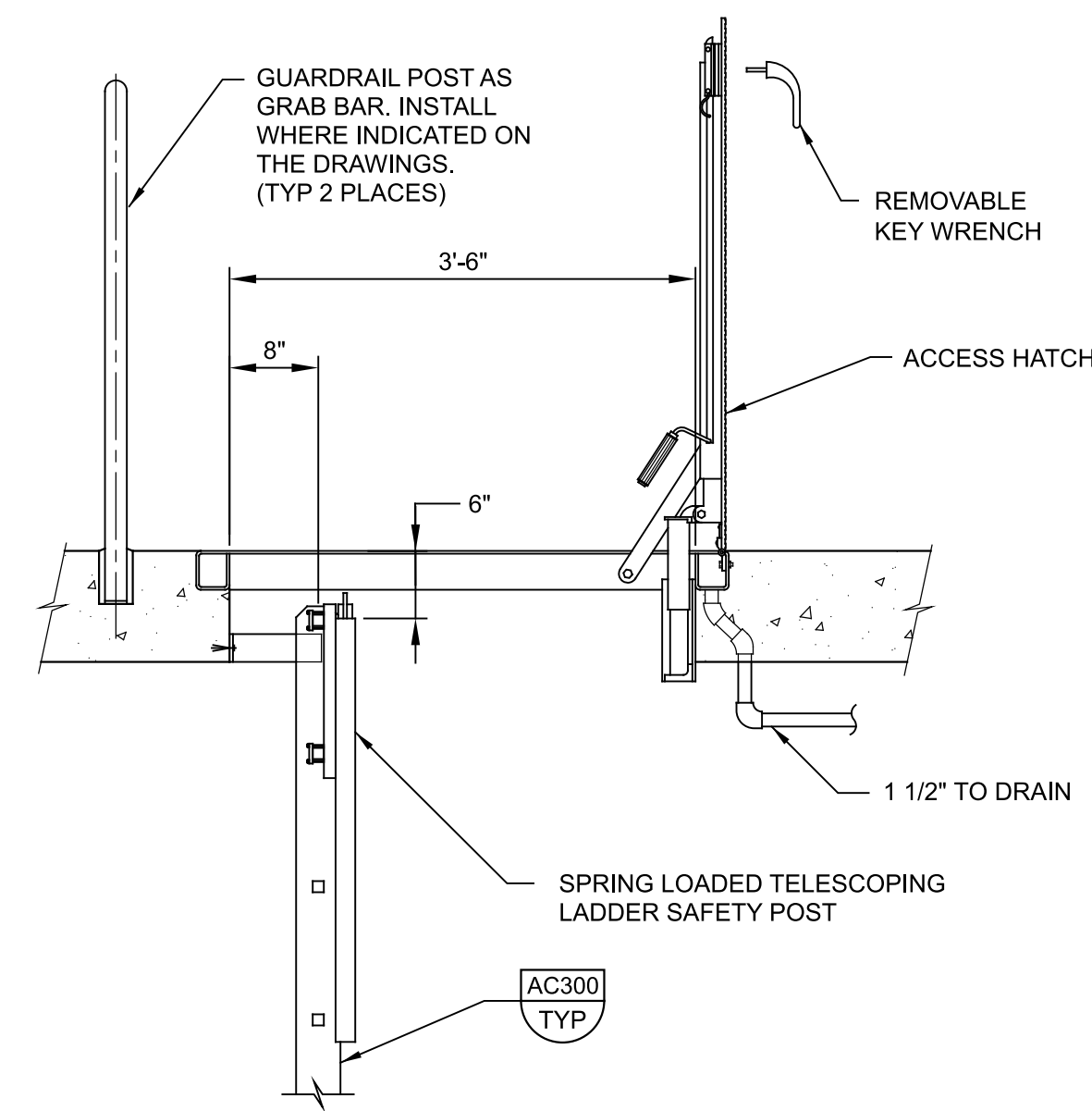


NOTES:

- SEE SPECIFICATIONS FOR H-20 HEAVY DUTY HOT-DIP GALVANIZED STEEL GRATING.
- MAKE REBATE AND/OR SEAT CONTINUOUS AROUND OPENING.
- EMBEDDED REBATE ANGLE AND PLATE SHALL BE 1/4" MINIMUM THICKNESS.
- HOT-DIP GALVANIZED AFTER FABRICATION.
- \* = DIMENSION AS REQUIRED BY GRATING MANUFACTURER. SEE SPECIFICATIONS.

**S545** GRATING - REBATE, H-20 HEAVY DUTY HOT-DIP GALVANIZED  
TYP

06/21/19



**S592** HATCH WITH LADDER  
TYP

06/21/19

**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

DESIGNED	CE
DRAWN	CE
CHECKED	CE
DATE	JULY 2023

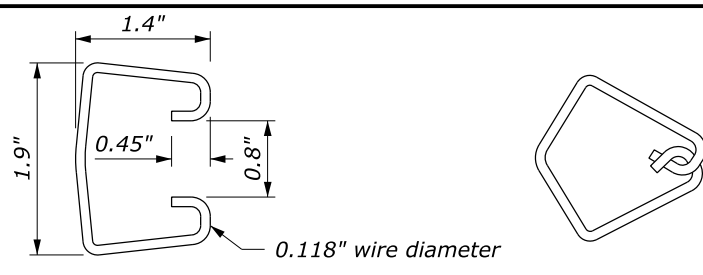


CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
TYPICAL

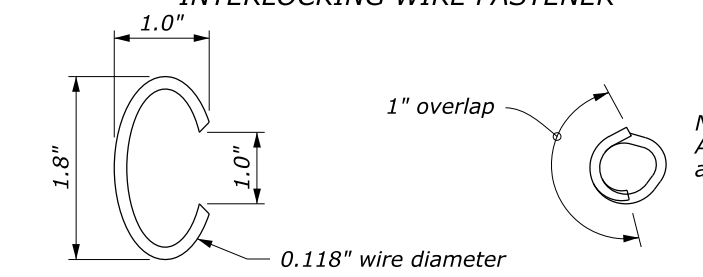
STRUCTURAL 1

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0 1"  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
DRAWING NO. TS01  
SHEET NO. OF XX



**INTERLOCKING WIRE FASTENER**  
0.118" wire diameter

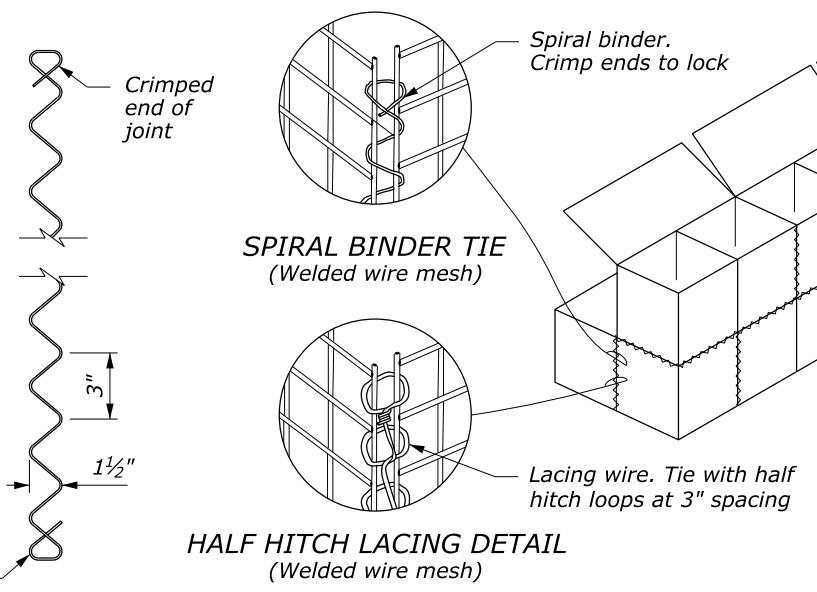


**OVERLAPPING RING WIRE FASTENER**  
0.118" wire diameter

**ALTERNATE TYING FASTENERS**  
(Not allowed for basket to basket connection)

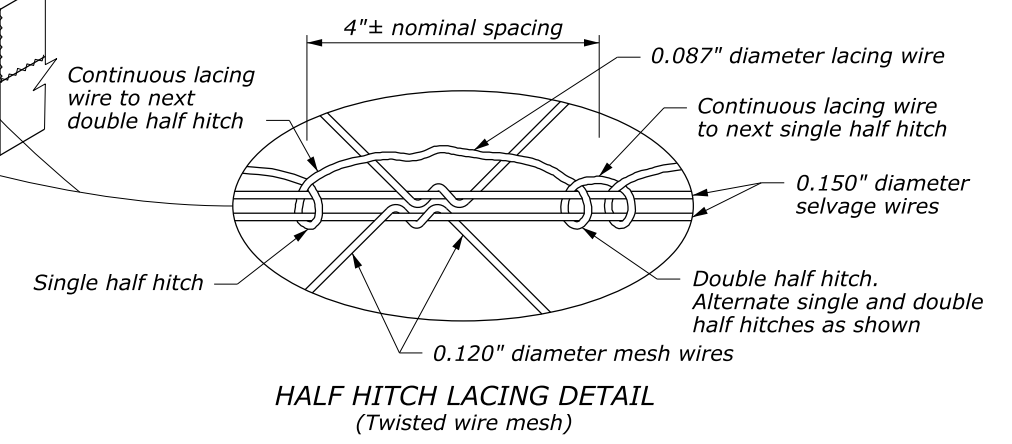
NOTE:  
All dimensions  
are nominal

NOTE:  
All dimensions  
are nominal



**SPIRAL BINDER TIE**  
(Welded wire mesh)

**HALF HITCH LACING DETAIL**  
(Welded wire mesh)

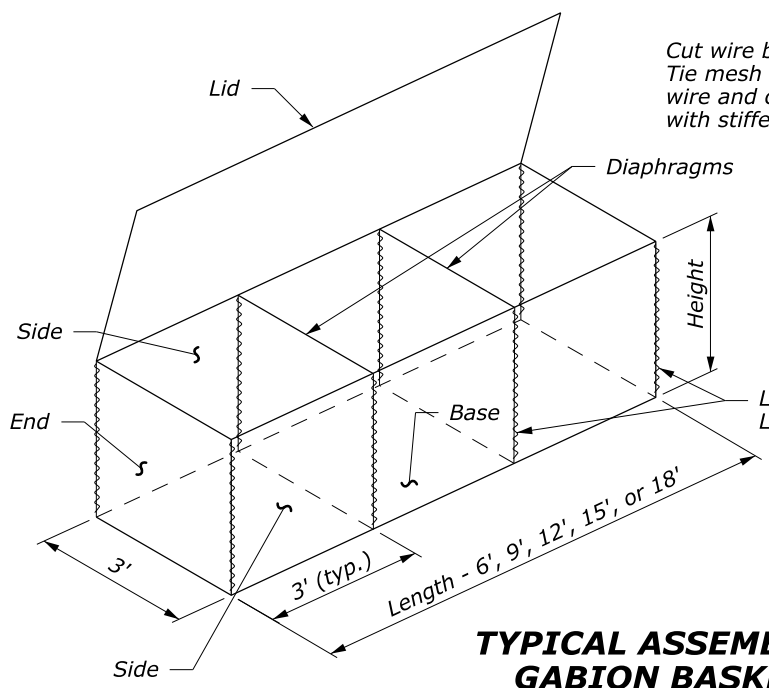


**HALF HITCH LACING DETAIL**  
(Twisted wire mesh)

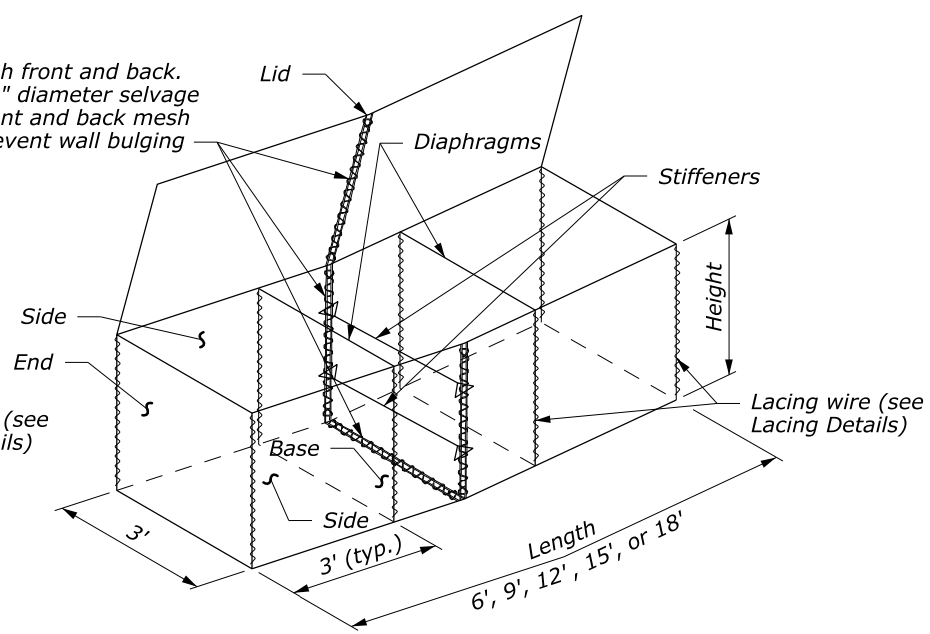
**TYPICAL INSTALLATION GABION BASKETS**

**0.150" DIAMETER SPIRAL BINDER**

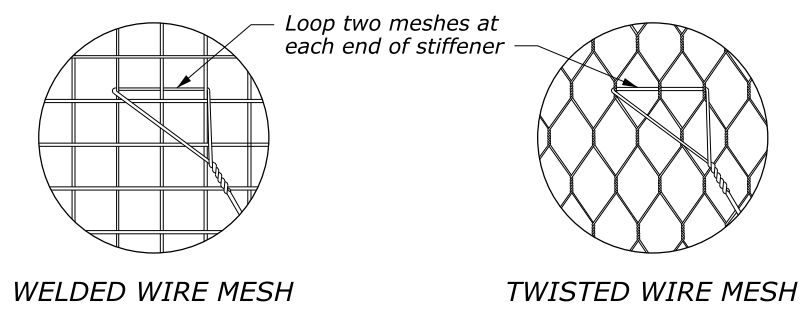
Cut wire basket mesh front and back. Tie mesh with 0.150" diameter selvage wire and connect front and back mesh with stiffeners to prevent wall bulging.



**TYPICAL ASSEMBLED GABION BASKET**

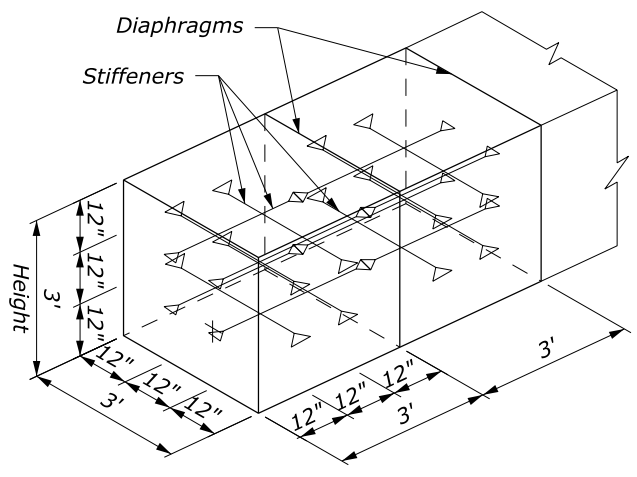


**ASSEMBLED GABION BASKET IN WALL GRADE TRANSITION AREAS**

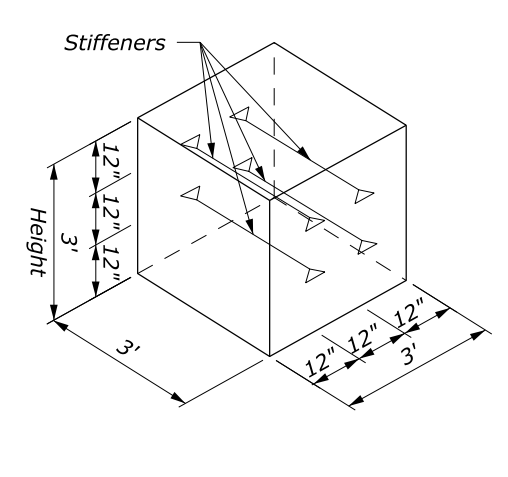


**WELDED WIRE MESH**

**TWISTED WIRE MESH**

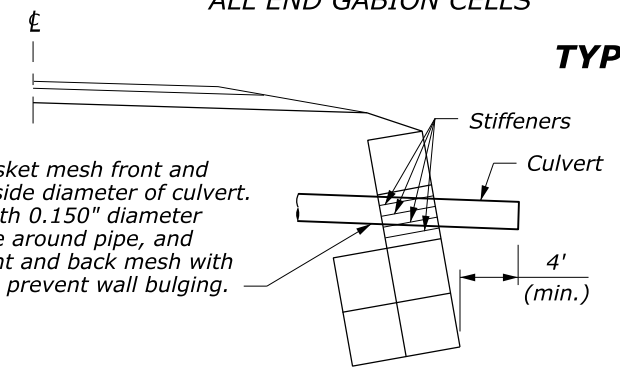


**ALL END GABION CELLS**



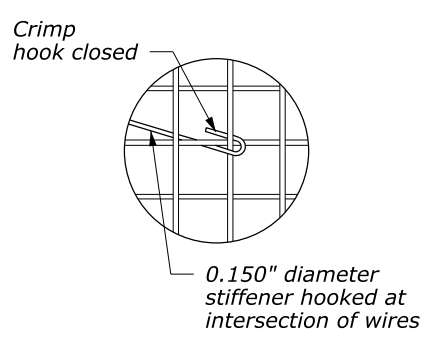
**ALL INTERIOR GABION CELLS**

**TYPICAL STIFFENERS**

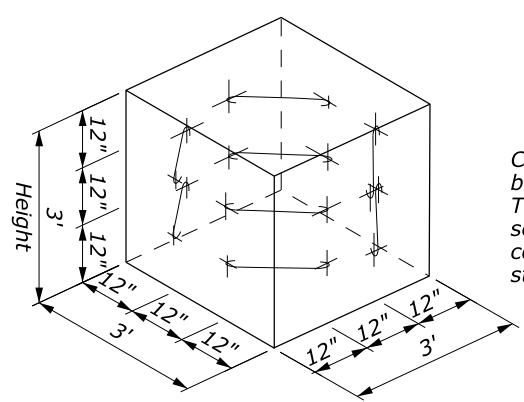


**TYPICAL CULVERT INSTALLATION THROUGH GABION WALL**

GABION BASKET NOMINAL SIZES AND CAPACITY				
Size Code Letter	Size in feet		Diaphragm Partitions	Capacity (CUYD)
	Length	Height		
A	6	3.0	1	2.00
B	9	3.0	2	3.00
C	12	3.0	3	4.00
X	15	3.0	4	5.00
Y	18	3.0	5	6.00
D	6	1.5	1	1.00
E	9	1.5	2	1.50
F	12	1.5	3	2.00
G	6	1.0	1	0.67
H	9	1.0	2	1.00
I	12	1.0	3	1.33



**OPTIONAL STIFFENERS WELDED WIRE GABION BASKET**



**ALL GABION CELLS**

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
WESTERN FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY DETAIL

**GABION BASKET**

DETAIL APPROVED FOR USE --/---  
REVIS: 9/2011  
DRAFT: 9/2011

DETAIL  
W253-1

# Appendix B

Geotechnical Memorandum and Report

**TECHNIAL MEMORANDUM**

To: Matt Sprick, Carollo Engineers, Inc.  
From: Alan P. Bean, Northwest Geotech, Inc.  
Date: August 16, 2023, NGI Project No. 3529.1.1  
Subject: Geotechnical Design Summary  
Project: Calaroga Sanitary Sewer Pump Station Replacement



Expiration Date: 12/31/23

The purpose of this memorandum is to provide a summary of our geotechnical recommendations and work to date including seismic assessment and slope stability related wall type recommendations as they relate to land use review and conformance with the West Linn Natural Hazards Mitigation Plan.

**Geology and Geotechnical Hazards Discussion**

The area is mapped as Columbia River Basalt Group (CRBG) bedrock near the surface and adjacent stretches of the riverbank area show the Missoula Flood Deposits formation manteling the weathered basalt in the form of a bench. This is consistent with the site borings which confirmed that the flood deposits are unsaturated and not prone to seismic liquefaction hazards. NGI recommended the use of a welded wire gabion retaining wall to laterally support the new pump station based on the following seismic and static slope stability considerations:

- 1). A gabion wall is generally self-draining, mitigating the primary hazard associated with a retaining wall in the flood zone. The primary hazard is hydrostatic pressure on the back side of a retaining wall during relatively rapid drawdown of flood water.
- 2). A gabion wall is one of the most resistant to overall slope stability hazards, as it forms a relatively large structural mass and wide base that forces any shear planes around it, thus providing a high factor of safety.
- 3). A gabion wall is flexible and can accommodate variable settlement conditions while maintaining all structural integrity.

NGI has completed a Geotechnical Data Report (included in the project land use submittal) and found that the weathered basalt was highly fractured and is not anticipated to pose any significant difficulty during construction, while providing a stable wall support. The existing pump station is also embedded in the weathered basalt. The weathered basalt is exposed in the adjacent creek bed, and no on-going erosion is evident (creek is not anticipated to erode vertically in the future). As a result, and based on seismic slope stability studies and long-term groundwater level monitoring, the proposed facility and wall are consistent with the intent and goals of the West Linn Natural Hazards Mitigation Plan, in our opinion.

Copies: (1) Addressee (E-mail only)

**Geotechnical Data Report  
Calaroga Sanitary Sewer Pump Station Replacement  
West Linn, Oregon**

**Prepared For**

**Carollo Engineers Inc.  
707 SW Washington Street, Suite 500  
Portland, Oregon 97205**

**August 18, 2023  
Project No. 3529.1.1**



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### APPENDICES

#### Appendix A

##### Boring Logs

- **Figure A-1 Boring B-1**
- **Figure A-2 Boring B-2**

#### Appendix B

##### Laboratory Testing

- **Figure B-1 B-1, 1-3' Undrained Shear Strength Test (Fill)**
- **Figure B-2 B-1, 3-5' Undrained Shear Strength Test (Fill)**
- **Figure B-3 B-1, 5-7' Undrained Shear Strength Test (MFD)**
- **Figure B-4 B-1, 7-9' Drained Direct Shear Test (MFD)**
- **Figure B-5 B-1, 11-13' Drained Direct Shear Test (MFD)**



## **1.0 SITE AND PROJECT DESCRIPTIONS**

The project site is located in West Linn, Oregon, along Calaroga Drive as shown on the Vicinity Map, Figure 1. The existing paved roadway is approximately 20 feet wide with minimal shoulders and was constructed as part cut and part fill which created a wedge of fill on the downhill side. In the general vicinity, the local topography rises and falls with moderate slopes, and a swale has been formed by a small creek eroding to the elevation of bedrock adjacent to the existing pump station wet well that extends approximately 18 feet into the bedrock. The proposed pump station will connect to the existing one and located within a widened shoulder area of Calaroga Drive, thus raising the top elevation of the pump station to near elevation 48 feet from the existing 32 feet elevation. This will be accomplished by widening Calaroga Drive in the immediate vicinity utilizing a retaining wall to replace the fill slope and provide for a vehicle width access outside of the travelled way.

There is an access drive that slopes gently upward from the existing pump station to Calaroga Drive. The creek just west of the existing pump station is within a channel a few feet below the driveway, and crosses beneath Calaroga Drive with a storm culvert and concrete weir structures to help control flow.

We understand proposed improvements will include the construction of a new pump station adjacent to Calaroga Drive utilizing a gabion retaining wall structure.

## **2.0 GEOLOGIC SETTING**

Review of published geologic literature<sup>1</sup> indicates that the near surface geology in the project vicinity is described and mapped as the fine-grained facies of the catastrophic flood deposits (Missoula Flood Deposits) that consist of sand to silty sand and generally forms a bench above elevation 30 parallel to the river. Below elevation 30, a thin mantle of recent alluvium is typically present over the weathered surface of the basalts of the Columbia River Basalt Group. An excerpt of the geologic map is provided in Figure 2.

## **3.0 SUBSURFACE EXPLORATIONS**

### **3.1 Borings**

The subsurface explorations consisted of performing two exploratory borings designated B-1 and B-2 which extended to depths of 40 feet and 26.5 feet, respectively. The approximate boring locations are shown on the Exploration Location Plan, Figure 3. The borings were performed by Western States Soil Conservation, Inc. with a track mounted drill rig utilizing mud rotary tooling which created a roughly 4-inch diameter borehole.

Sampling was typically performed at 2.5 foot intervals except at boring B-1, where continuous thin-walled shelly tube sampling was utilized in the upper portion of the boring in the fine grained soils until decomposed basalt was encountered. Standard penetration testing (SPT) was performed

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<sup>1</sup>M.H. Beeson and others 1989, *Geologic Map of the Lake Oswego Quadrangle: U.S. Geological Survey, scale 1:24,000.*

where fine grained soils and decomposed basalt were encountered elsewhere. HQ rock coring was initially planned for the bedrock; however due to the decomposed and fractured nature of the basalt, it was determined that coring would be impractical and result in minimal recovery. The rate of mud rotary drilling progressed similar to that of a dense gravel.

Once the drilling and in-situ testing was completed, the borings were backfilled in accordance with Oregon Water Resources Department regulations. Vibrating wire piezometers were installed in both borings and a data logger was added to boring B-1 for periodic daily readings of the groundwater level. Boring B-2 was periodically manually read. The resulting data recovered is discussed in section 4.3.

Each boring was logged by a geologist from our office who visually classified the subsurface soils according to the Unified Soil Classification system. The collected samples were returned to our laboratory for refinement of field classifications and laboratory testing. The formal boring logs are provided in Appendix A, Figures A-1 through A-2 and describe conditions encountered and the results of the SPT testing.

#### **4.0 SUBSURFACE CONDITIONS**

##### **4.1 Pavement Sections**

The existing Asphaltic Concrete pavement thickness of Calaroga Drive is 3 inches in thickness at boring location B-1, and the existing pavement thickness of the access road is 2.5 inches at boring location B-2. The aggregate base section within the existing roadway was approximately 9 inches and consisted of crushed aggregate at boring location B-1. The road base section for the access road consisted of 6 inches of crushed aggregate at boring B-2.

##### **4.2 Subsurface Conditions**

A geologic profile was developed for the proposed project alignment through the two wet wells and connecting pipeline at the location identified in the Boring Location Plan, Figure 3. The resulting geologic profile, designated Section A-A', is provided in Figure 4. The wedge of silty clay fill indicated on the section was typically medium stiff (manual Torvane shear strength of 0.5 tons/square foot), but can be expected to be soft in the outer edges of the poorly compacted fill. A similar variable thickness of fill was encountered in boring B-2 below the driveway paving. Underlying the fill at boring B-1, Missoula Flood Deposits (also referred to as the fine grained facies of the catastrophic flood deposits on older geologic maps) were encountered that consisted of silty fine to medium grained sand with intermittent 2–6-inch thick silty clay and clayey silt lenses. At the lower boring B-2 location, the Missoula flood deposits were absent, and a thin layer of recent alluvium deposited by floods or the nearby stream underlies the fill and consists of a medium stiff clayey silt. A thin layer of colluvium (stiff silty clay) was present between the flood deposits and the weathered basalt that was observed to the extent of our explorations. The weathering of the basalt varied and samples recovered can best be described as an angular sandy gravel with variable silt and clay content.

### **4.3 Groundwater**

Vibrating wire piezometers were installed in each boring to monitor groundwater conditions throughout the year; the readings are plotted in feet (project survey elevations) over time in Figure 5. Boring B-1 periodically had a data logger attached to record the daily response to typical short term winter weather precipitation events. Thus, the groundwater levels are anticipated to fluctuate seasonally and daily/weekly responding to both storm cycles and seasonally, but generally are at levels between elevations 25 and 29 feet, with highest levels in the March to April time frame.

### **5.0 LABORATORY TESTING**

Representative soil samples obtained during our subsurface exploration program were tested in the laboratory to assist with soil classification and to evaluate selected engineering properties.

The laboratory testing program consisted primarily of strength testing and associated parameters such as moisture content and unit weight of the tested samples. The strength tests consisted of the following:

- Two triaxial, undrained, fully saturated “R” tests, US Army Corps of Engineers EM 1110-2-1906.
- Two Direct Shear – ASTM D3080

Manual Torvane testing was also performed on a sample of the fill from boring B-1. The triaxial and direct shear test results are provided in Appendix B, and related moisture and unit weight data are provided on the boring logs in Appendix A.

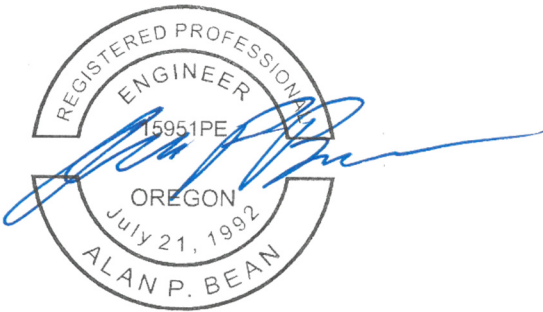
### **6.0 LIMITATIONS**

Within the limitations of scope, schedule, and budget, our services have been completed in accordance with the Client Services Agreement and accepted geotechnical practices in this area at the time this report was prepared. This report was prepared for the exclusive use of NGI’s client for the specific project and NGI does not authorize the segmented use of the data herein. The formal boring logs and related information depict generalized subsurface conditions at these specific locations only and at the particular time the subsurface exploration was completed. Soil and groundwater conditions at other locations may differ from the conditions at locations of explorations. Also, the passage of time may result in a change in the soil and groundwater conditions at the site. This report pertains to the subject project area only, and is not applicable to adjacent areas nor is it valid for types of development other than that to which it refers.

This opportunity to be of service is sincerely appreciated. If you should have any questions, please contact our office.

Respectfully submitted,

NORTHWEST GEOTECH, INC.



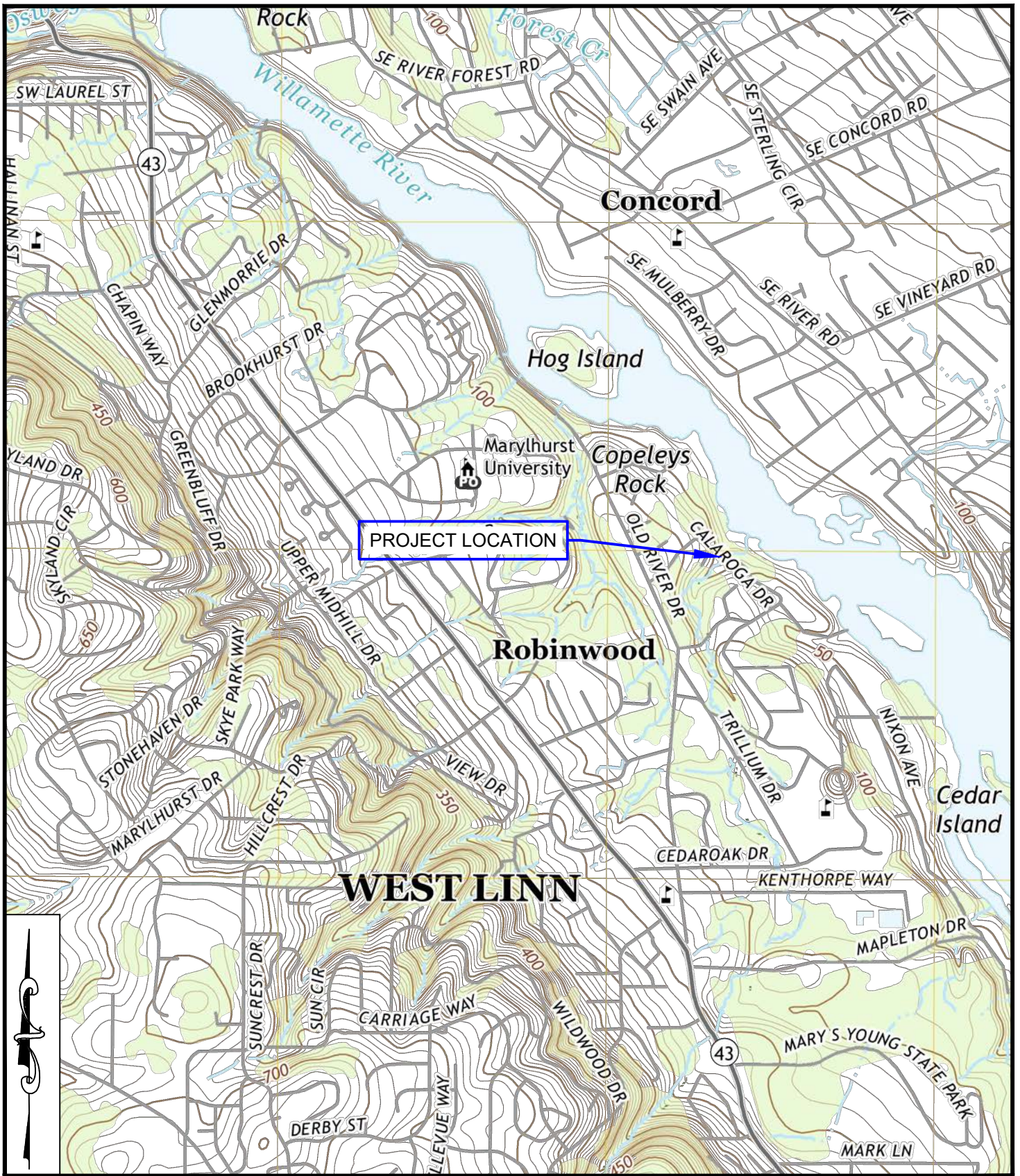
Expiration Date: *12/31/83*

Alan P. Bean, P.E., G.E.  
Senior Geotechnical Engineer

A handwritten signature in blue ink, appearing to read "T. Ginsbach".

Thomas S. Ginsbach, P.E., G.E.  
Regional Vice President

Copies: (1) Addressee (E-mail)

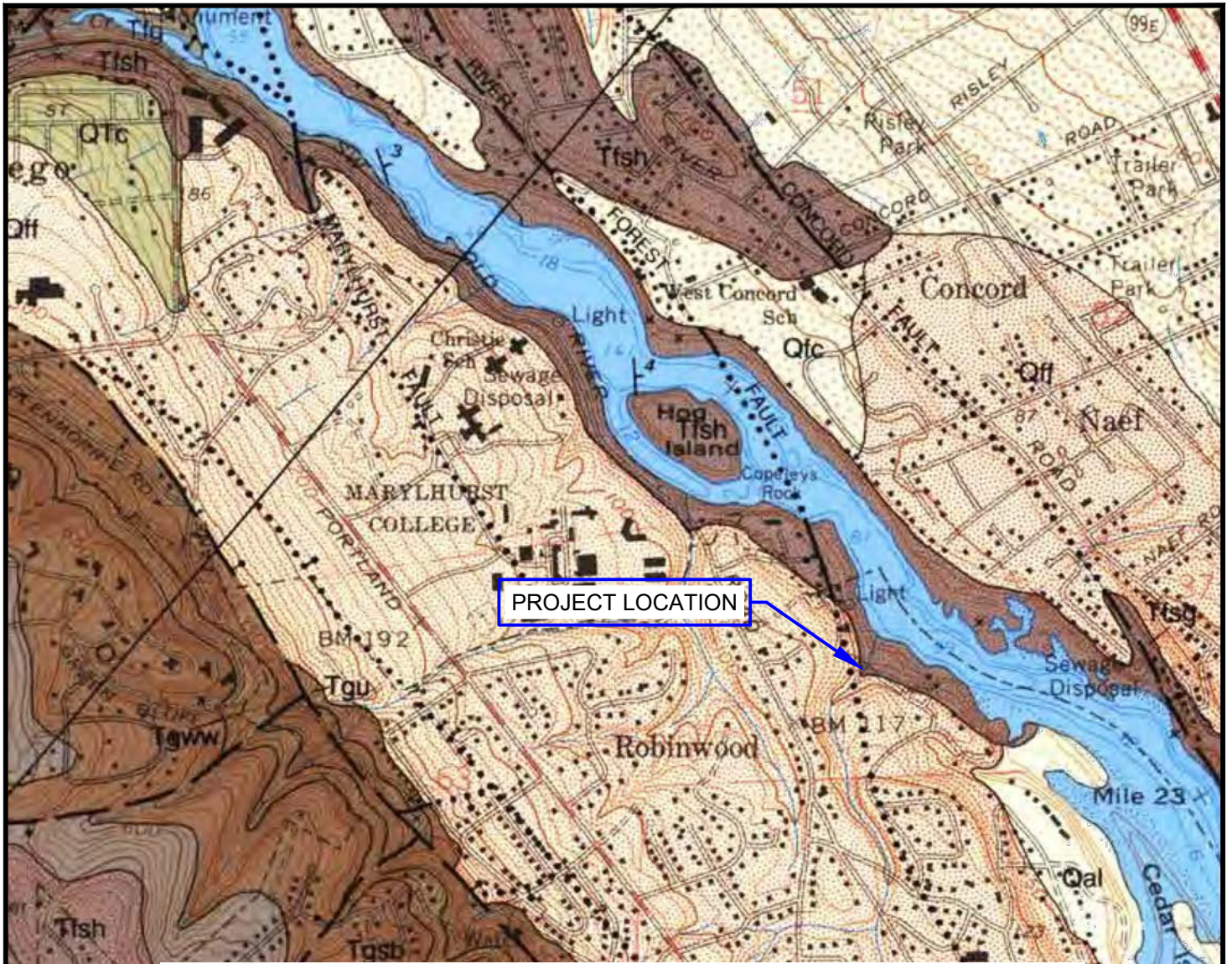


### VICINITY MAP

PROJECT NO. 3529.1.1

CALOROGA SANITARY SEWER  
PUMP STATION REPLACEMENT  
WEST LINN, OREGON

FIGURE NO. 1



**Fine-grained facies (Pleistocene)** — Coarse sand to silt deposited by catastrophic floods. The finer sediments are predominantly quartz and feldspar and also contain white mica. The coarser sediments are predominantly Columbia River basalt fragments. Poorly defined beds of 1- to 3-ft thickness are observed in outcrop, and complex layering is recorded in boreholes. Soil development commonly introduces significant clay into the upper 6-15 ft of the deposits. The fine sediments are locally thick in the lower portions of the area and extend upslope as a mantle to an elevation between 300 and 350 ft



**Columbia River Basalt Group (middle Miocene)** — Miocene tholeiitic flood-basalt flows that were erupted from long linear fissure systems in northeastern Oregon, eastern Washington, and western Idaho from approximately 17 to 6 Ma (Swanson and others, 1979; Hooper, 1982). Many individual flows are known to be huge in size, often covering thousands to tens of thousands of square miles and ranging from hundreds to thousands of cubic miles in volume (Tolan and others, 1989). These flows entered western Oregon via a wide gap in the northern Oregon Miocene Cascade Range (Beeson and others, 1985; Beeson and Tolan, in press); some flows even reached the Pacific Ocean (Beeson and others, 1979). Significant differences and variations in the geochemical, paleomagnetic, and lithological properties of Columbia River Basalt Group flows allow this series of flood-basalt flows to be formally divided into five formations (Swanson and others, 1979) and also enable these formations to be further subdivided into a host of mappable members and units (Swanson and others, 1979; Beeson and others, 1985; Reidel and others, 1989). Members and units belonging to the Wanapum and Grande Ronde Basalts, two of the five Columbia River Basalt Group formations, are present within the map area and have a collective thickness ranging up to >670 ft



## GEOLOGIC MAP

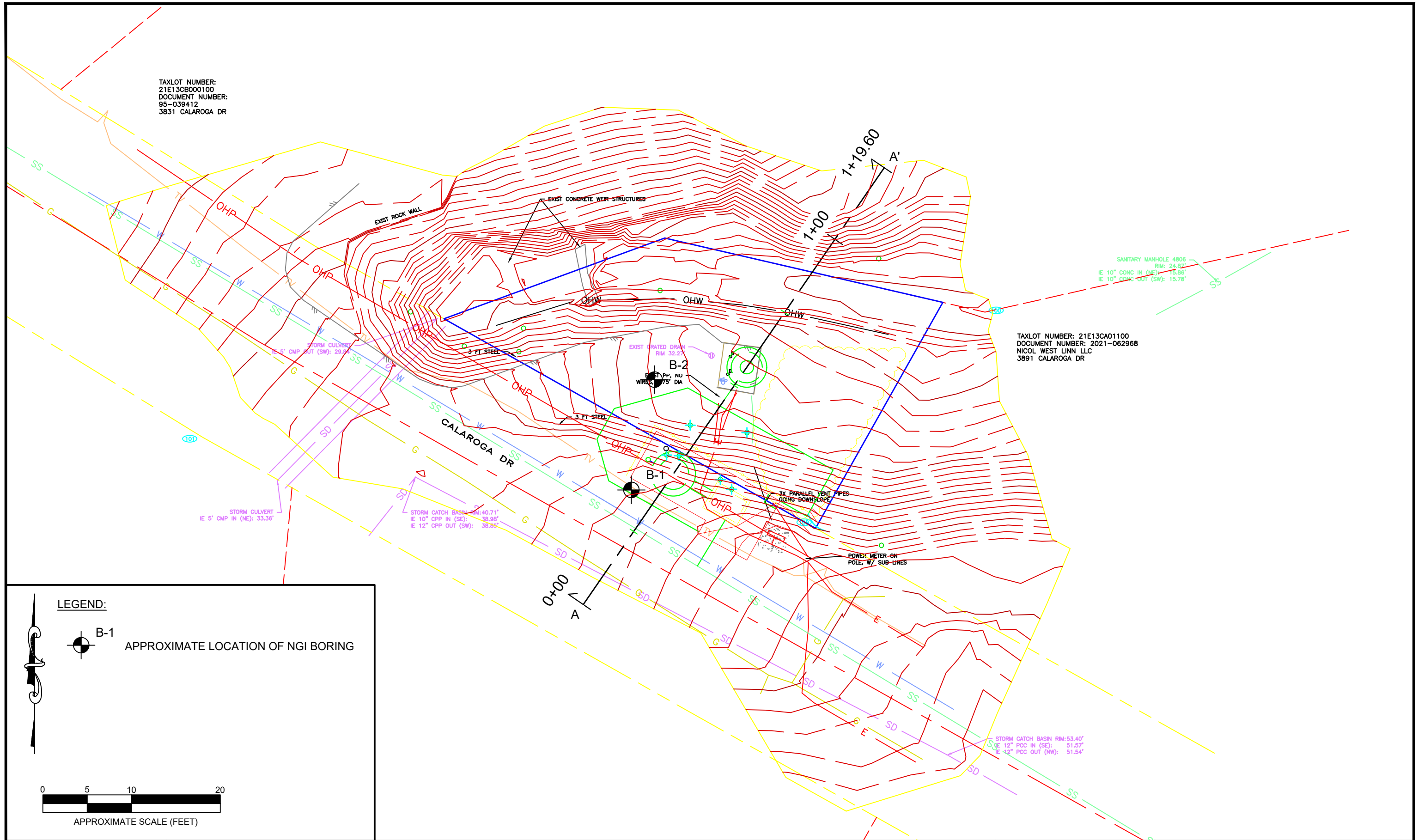
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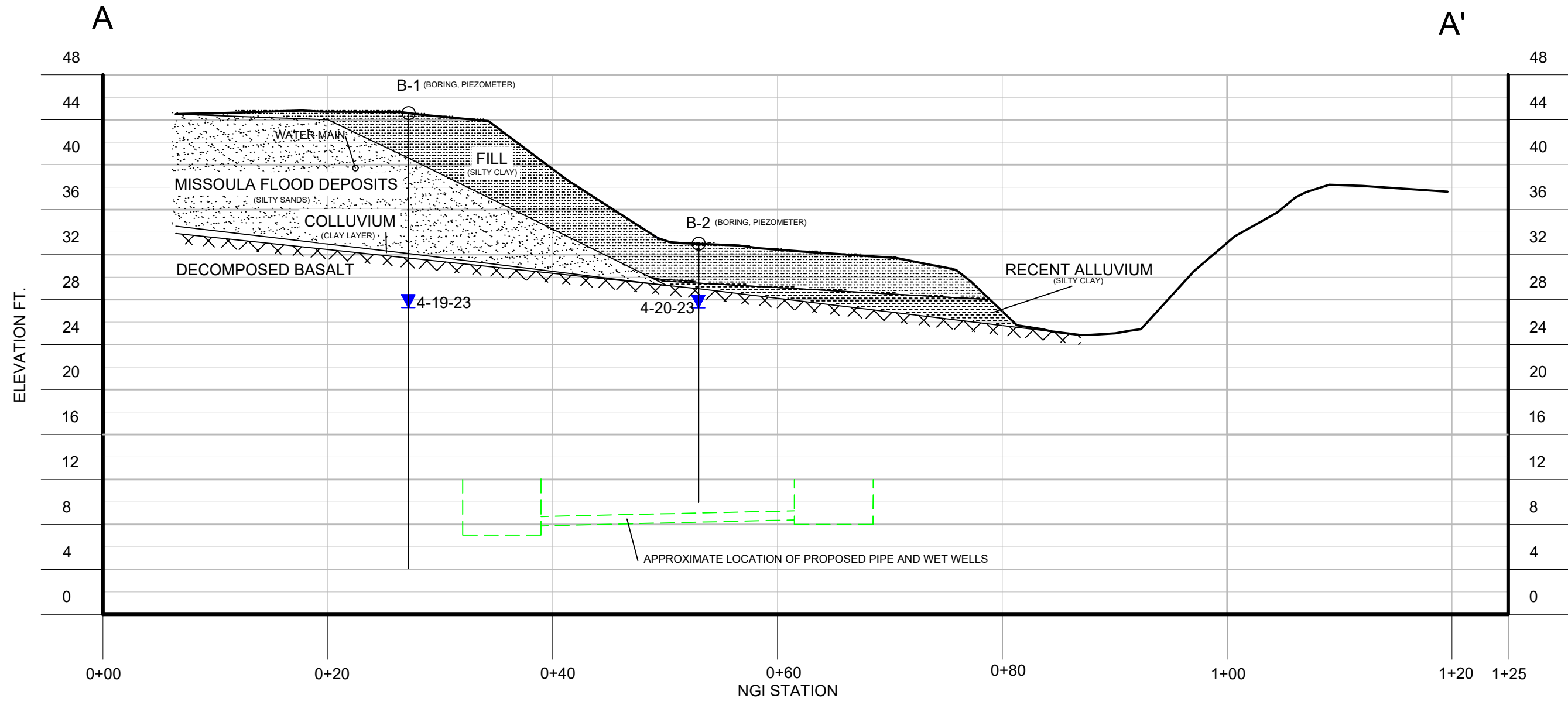
CALOROGA SANITARY SEWER  
PUMP STATION REPLACEMENT  
WEST LINN, OREGON

FIGURE NO. 2

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DOCUMENT NUMBER:  
95-039412  
3831 CALAROGA DR

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DOCUMENT NUMBER: 2021-062968  
NICOL WEST LINN LLC  
3891 CALAROGA DR



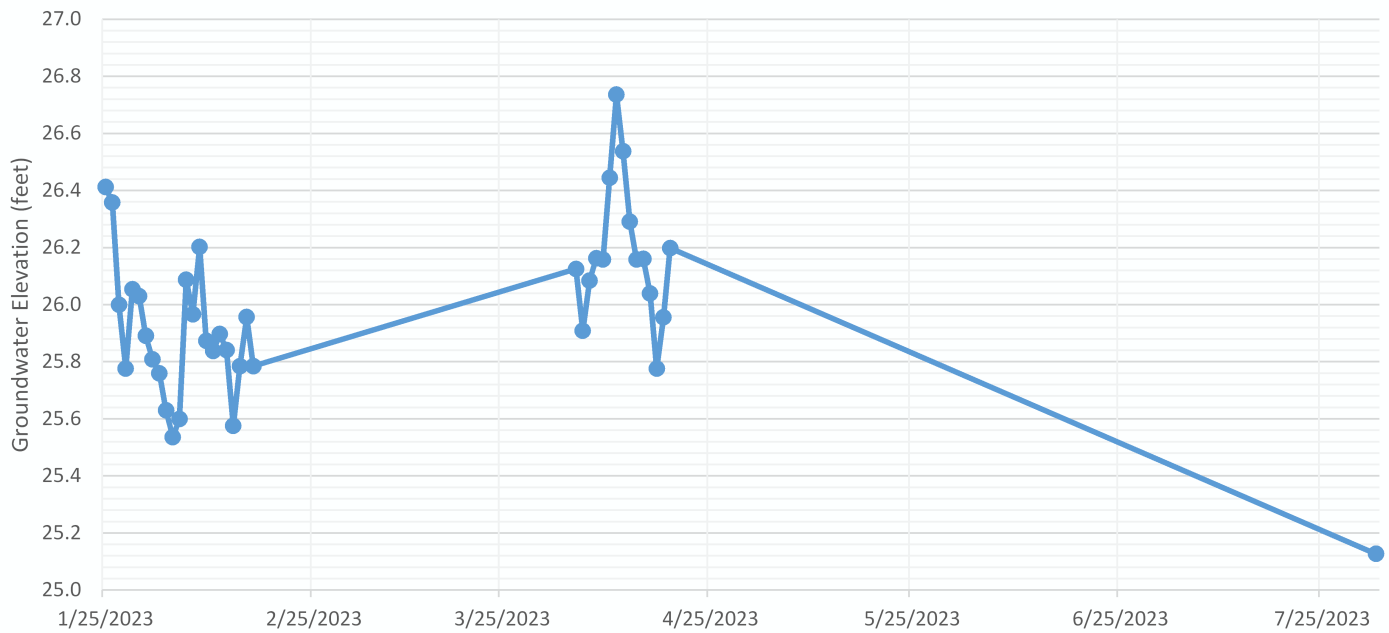


APPROXIMATE SCALE (FEET)

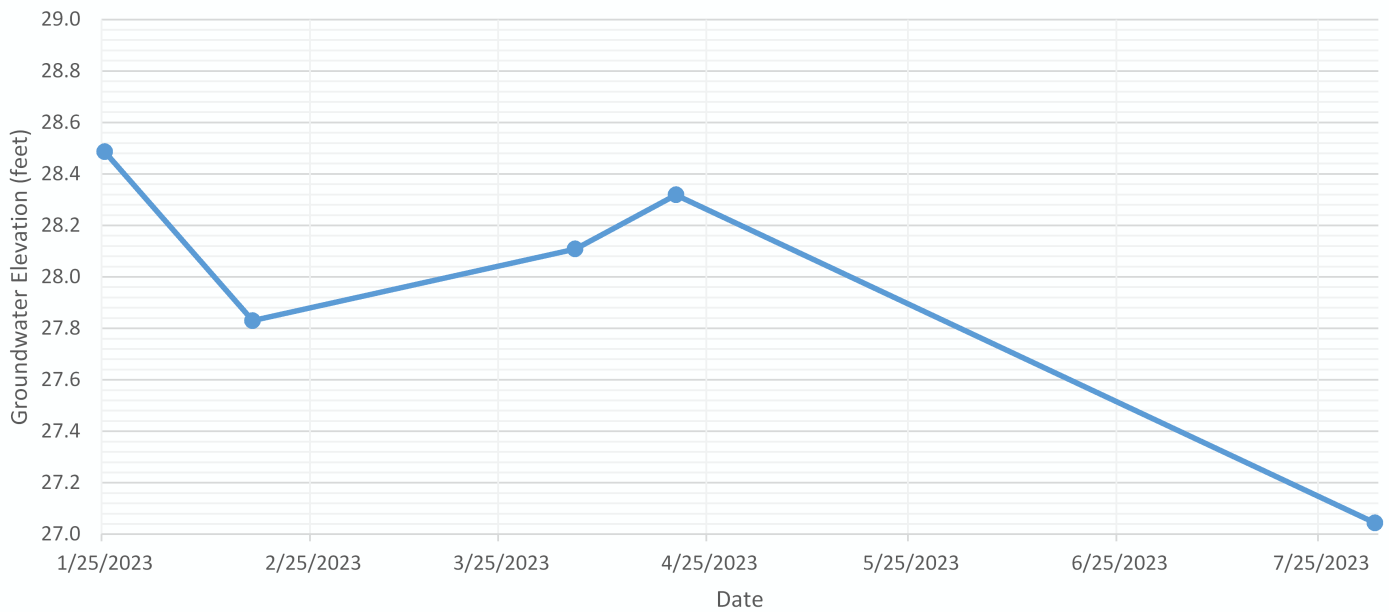
NO VERTICAL EXAGGERATION



Piezo Installed in Boring B-1 at 39 feet BGS



Piezo Installed in Boring B-2 at 21 feet BGS



### VW PIEZOMETER DATA

PROJECT NO. 3529.1.1

CALOROGA SANITARY SEWER  
PUMP STATION REPLACEMENT  
WEST LINN, OREGON

FIGURE NO. 5

## **APPENDIX A**

DRILLING COMPANY: WESTERN STATES		RIG: CME 55 HT TRACK RIG		DATE: 1/23/2023			
BORING DIAMETER: 5 INCHES		DRIVE WEIGHT: 140 LBS		DROP: 30 INCHES		ELEVATION: ~44.0 FT	
LENGTH (FEET)	VW PIEZOMETER	DRIVE SAMPLE BLOWS/FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS (U.S.C.S.)	SOIL DESCRIPTION BORING NO. B-1	
0						3 INCHES OF AC UNDERLAIN BY 9 INCHES OF AGGREGATE BASE	
		PUSH			CL	SILTY CLAY, MEDIUM STIFF, BROWN, MOIST, MEDIUM PLASTICITY, TRACE ORGANICS, POORLY COMPACTED (FILL) TORVANE = 0.5 TSF AT 2 FEET	
		PUSH					
5		PUSH	87.9	31.6	SM	SILTY SAND WITH 2-6 INCH INTERMITTENT SILTY CLAY LENSES, LOOSE, BROWN, MOIST, LOW PLASTICITY FINES, TRACE ORGANICS (MISSOULA FLOOD DEPOSITS)  WET DENSITY (pcf) = 115.7 AT 4.0 TO 4.5 FEET	
		PUSH					
10		PUSH				NOTE: WET, THIN ZONE OF PERCHED GROUNDWATER ON COLLUVIUM SURFACE	
		PUSH			GC	CLAYEY GRAVEL, STIFF, GRAY, WET, MEDIUM TO HIGH PLASTICITY FINES, MEDIUM TO COARSE, SUBANGULAR TO SUBROUNDED GRAVEL (COLLUVIUM)	
15		27				BASALT WITH SOME VESICLES, GRAY, R0 - R1 HARDNESS, VERY CLOSE JOINTING, DECOMPOSED, SECONDARY MINERALIZATION IN VESICLES (WEATHERED COLUMBIA RIVER BASALT GROUP)	
		25-50/3"					
20		50/3"					
		50/4"					
25		36					
30							

## BORING LOG B-1

PROJECT NO. 3529.1.1	CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT WEST LINN, OREGON	FIGURE NO. A-1 (1/2)
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DRILLING COMPANY: WESTERN STATES

RIG: CME 55 HT TRACK RIG

DATE: 1/23/2023

BORING DIAMETER: 5 INCHES

DRIVE WEIGHT: 140 LBS

DROP: 30 INCHES

ELEVATION: ~44.0 FT

LENGTH (FEET)	VW PIEZOMETER	DRIVE SAMPLE BLOWS/FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS (U.S.C.S.)	SOIL DESCRIPTION  BORING NO.  B-1
30		50/3"				BASALT WITH SOME VESICLES, GRAY, R0 - R1 HARDNESS, VERY CLOSE JOINTING, DECOMPOSED (WEATHERED COLUMBIA RIVER BASALT GROUP)
		50/2"				
		50/4"				
		50/4.5"				
		50/4.5"				
						TOTAL DEPTH: 40.4 FEET GROUNDWATER MEASURED AT 17.8 FEET (4/19/2023) GROUNDWATER MEASURED AT 18.9 FEET (8/02/2023)  □ SPT SAMPLER ■ SHELBY SAMPLER    VIBRATING WIRE PIEZOMETER (SN:2102090) INSTALLED AT 39 FEET

## BORING LOG B-1

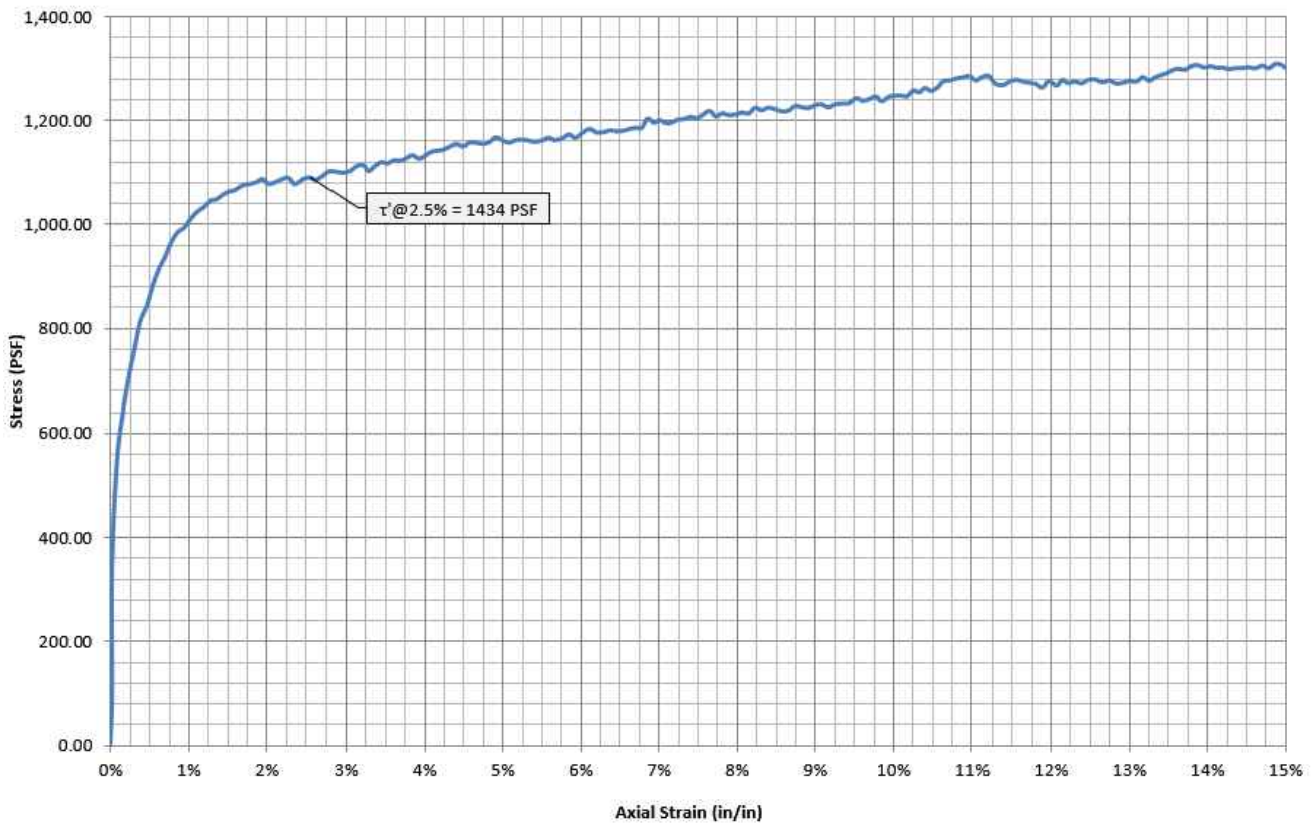
PROJECT NO. 3529.1.1

CALAROGA SANITARY SEWER  
PUMP STATION REPLACEMENT  
WEST LINN, OREGON

FIGURE NO. A-1  
(2/2)



## **APPENDIX B**



SYMOL	SAMPLE LOCATION	MASS (GRAMS)	LENGTH (INCHES)	DIAMETER (INCHES)	AREA (INCHES <sup>2</sup> )	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	$\tau'$ (PSF)
—	B-1 @ 1-3 FT (FILL)	1039.13	5.848	2.843	6.347	34.1	79.6	1434

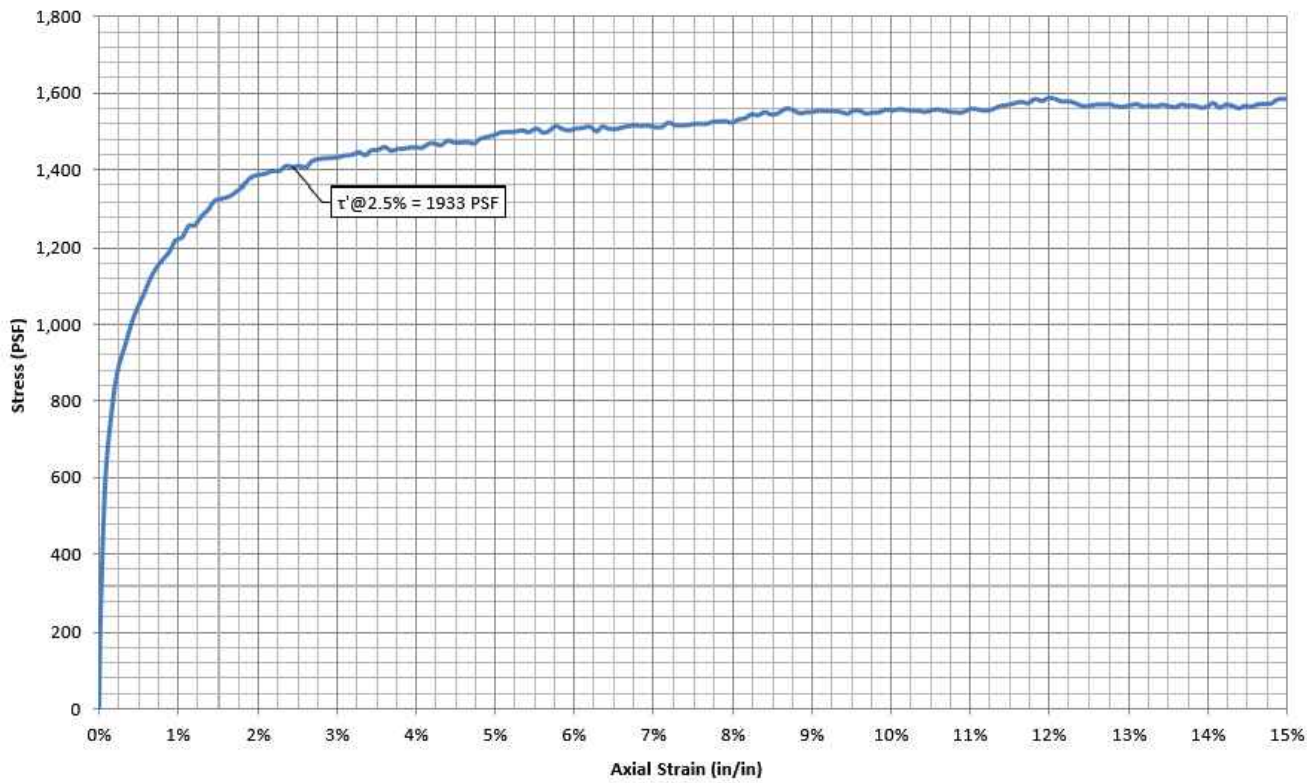
CONFINING PRESSURE = 1220 PSF

## SHEAR STRENGTH "R" TEST-(USACE EM 1110-2-1906)

PROJECT NO. 3529.1.1

CALOROGA SANITARY SEWER  
PUMP STATION REPLACEMENT  
WEST LINN, OREGON

FIGURE NO. B-1



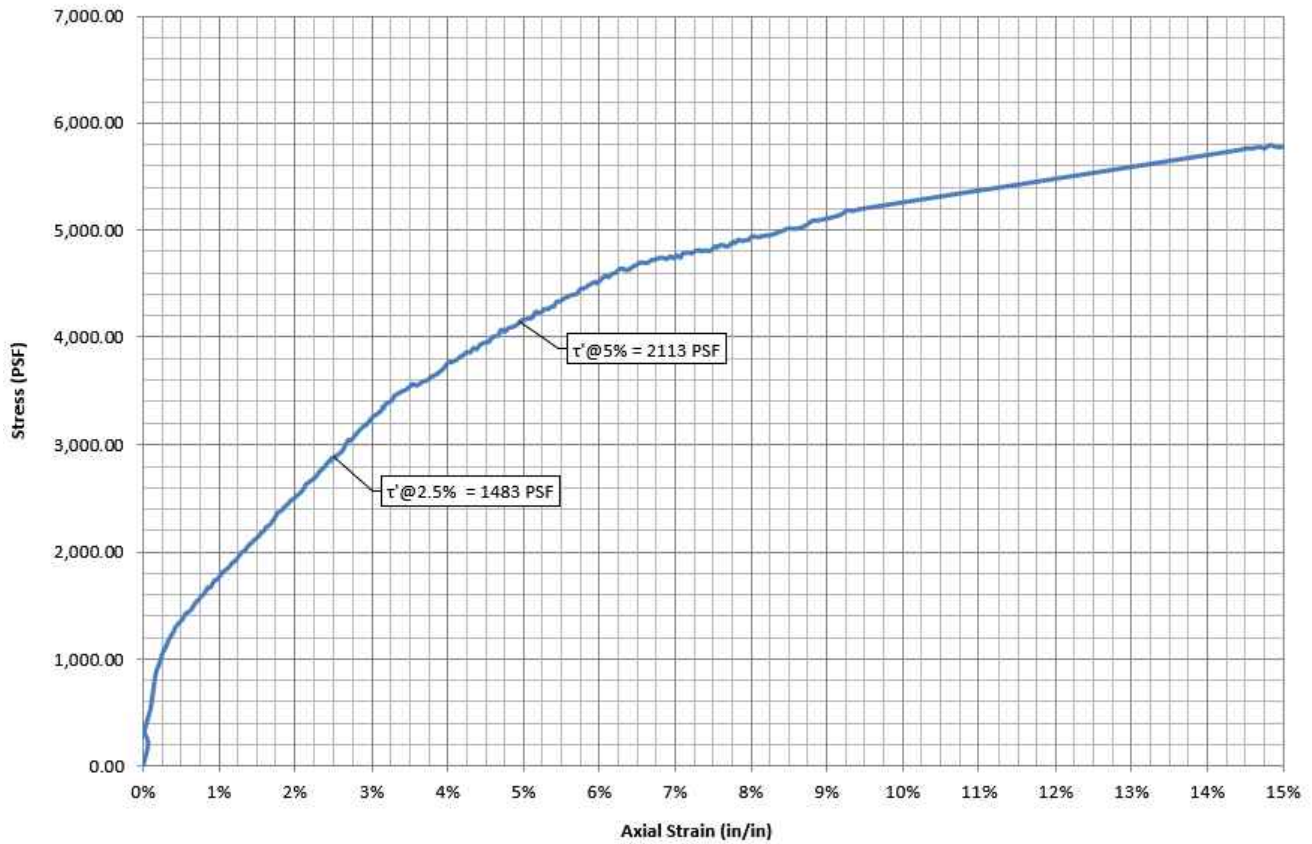
SYMBOL	SAMPLE LOCATION	MASS (GRAMS)	LENGTH (INCHES)	DIAMETER (INCHES)	AREA (INCHES <sup>2</sup> )	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	$\tau'$ (PSF)
—	B-1 @ 3-5 FT (MISSOULA FLOOD DEPOSITS)	1126.21	5.729	2.817	6.232	31.6	87.9	1933

CONFINING PRESSURE = 500 PSF

### SHEAR STRENGTH "R" TEST-(USACE EM 1110-2-1906)

PROJECT NO. 3529.1.1	CALOROGA SANITARY SEWER PUMP STATION REPLACEMENT WEST LINN, OREGON	FIGURE NO. B-2
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SYMBOL	SAMPLE LOCATION	MASS (GRAMS)	LENGTH (INCHES)	DIAMETER (INCHES)	AREA (INCHES <sup>2</sup> )	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	$\tau'$ (PSF)
—	B-1 @ 5-7 FT (MISSOULA FLOOD DEPOSITS)	1074.16	5.662	2.833	6.305	32.5	86.5	1483

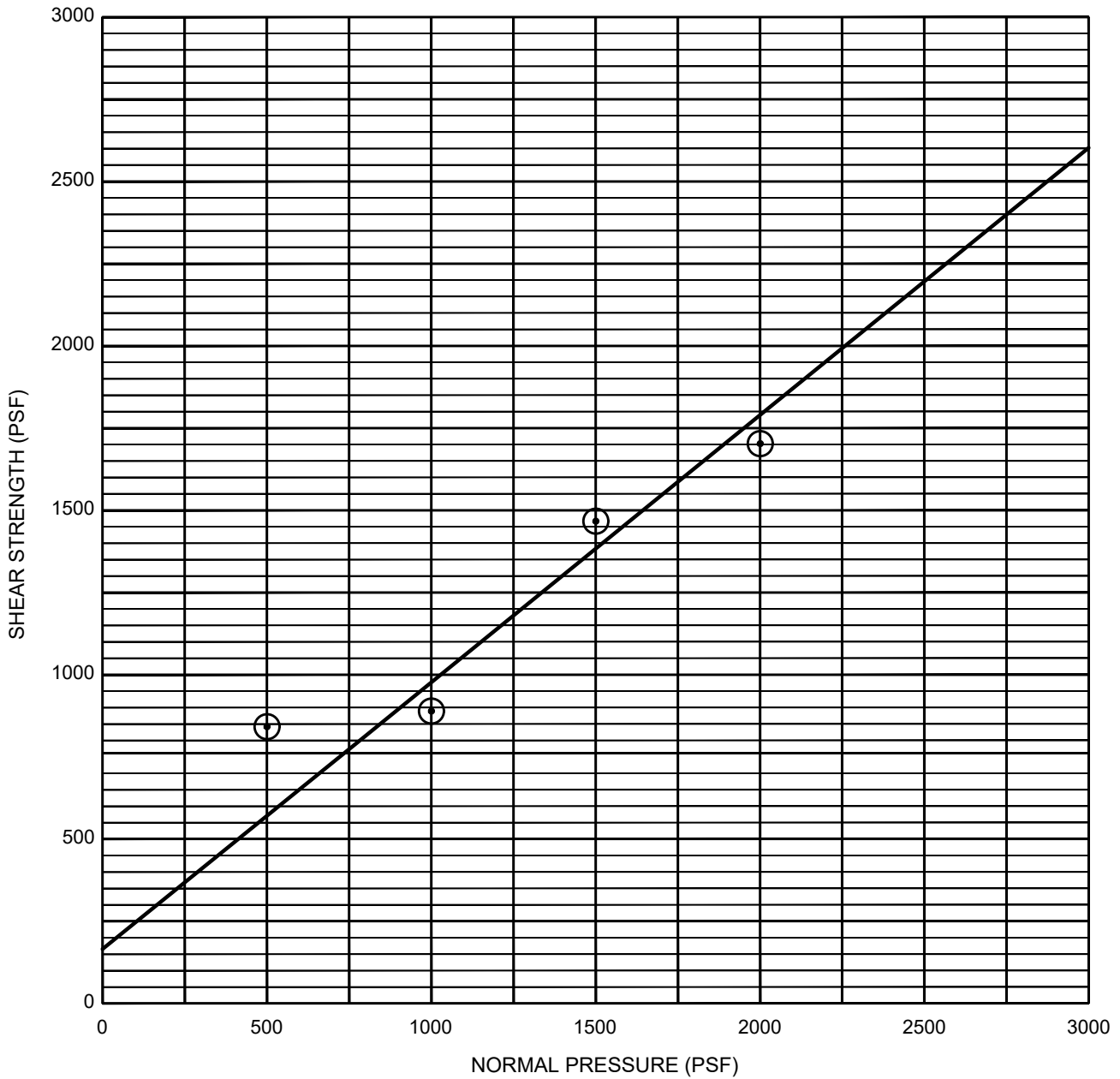
CONFINING PRESSURE = 750 PSF

## SHEAR STRENGTH "R" TEST-(USACE EM 1110-2-1906)

PROJECT NO. 3529.1.1

CALOROGA SANITARY SEWER  
PUMP STATION REPLACEMENT  
WEST LINN, OREGON

FIGURE NO. B-3



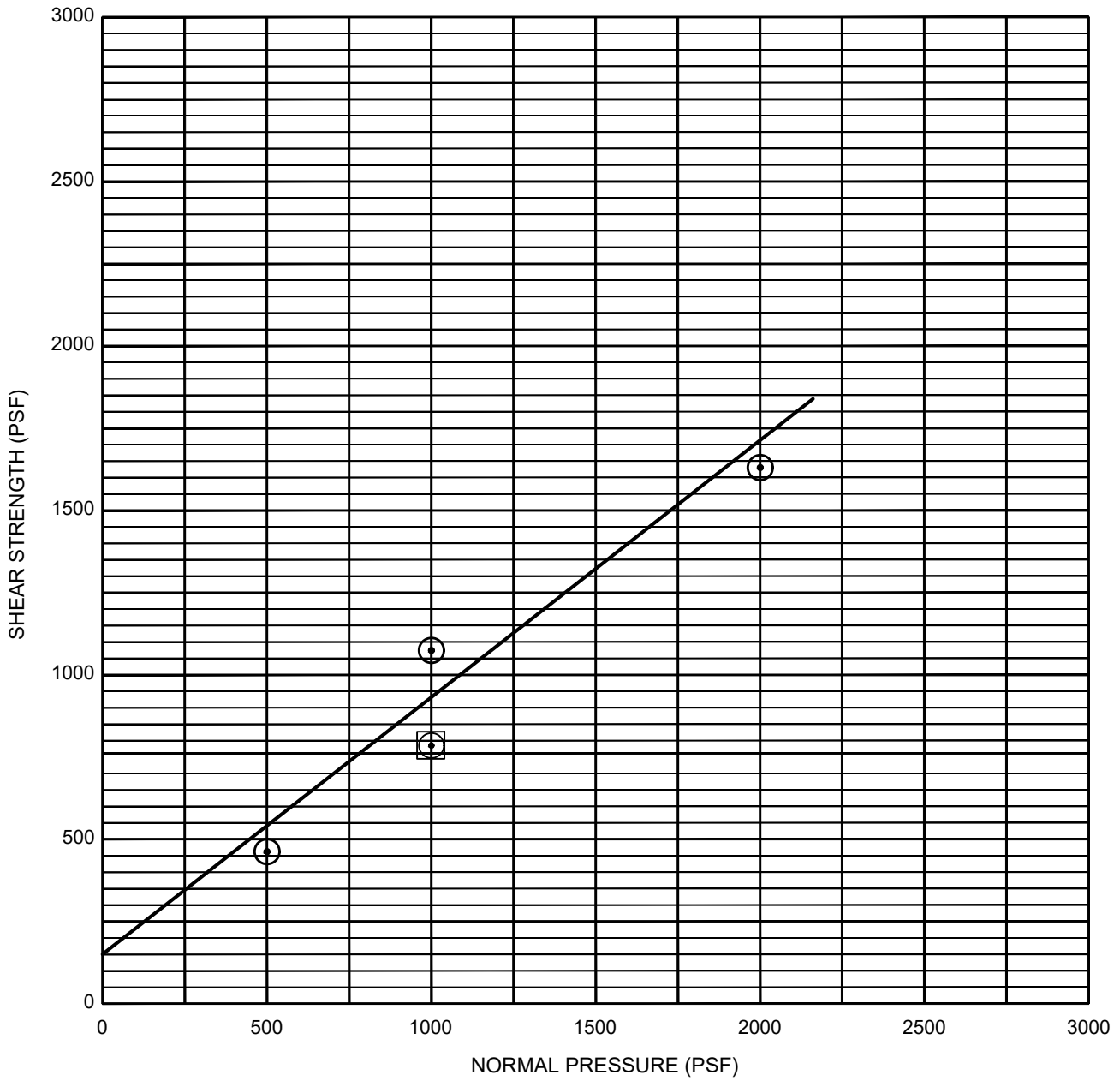
SYMBOL	SAMPLE LOCATION	COHESION (psf)	FRICTION ANGLE	REMARKS
⊙	B1 @ 7 - 9 FT.	160	39.1	SATURATED; UNDISTURBED SILTY SAND ALLUVIUM (MISSOULA FLOOD DEPOSITS)

## DIRECT SHEAR TEST RESULTS - ASTM D3080

PROJECT NO. 3529.1.1

CALOROGA SANITARY SEWER  
PUMP STATION REPLACEMENT  
WEST LINN, OREGON

FIGURE NO. B-4



SYMBOL	SAMPLE LOCATION	COHESION (psf)	FRICTION ANGLE	REMARKS
⊙	B1 @ 11 - 12 FT.	150	38.0	SATURATED; UNDISTURBED
⊠	B1 @ 12 - 13 FT.			

## DIRECT SHEAR TEST RESULTS - ASTM D3080

PROJECT NO. 3529.1.1

CALOROGA SANITARY SEWER  
PUMP STATION REPLACEMENT  
WEST LINN, OREGON

FIGURE NO. B-5

# Appendix C

## Natural Resources Report



DAVID EVANS  
AND ASSOCIATES INC.

MEMORANDUM

**DATE:** September 19, 2023

**TO:** Erich Lais (West Linn)

**FROM:** Ethan Rosenthal, Ecologist, David Evans and Associates, Inc. (DEA)

**SUBJECT:** Calaroga Pump Station Natural Resources Site Review

**CC:** Corianne Burnett (Carollo), Susanna Julber (Conzor)

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**1. Introduction**

This memorandum reviews regulated natural resources in and adjacent to the Calaroga Sanitary Sewer Pump Station, located at 3821 S. Calaroga Drive, West Linn, Oregon. This review has been conducted to support local land use permitting related to improvements proposed for the pump station that is operated by the City of West Linn (City).

The pump station was constructed in the 1970's. The pump station consists of a buried wet well with a dry pit over the well and an at-grade access hatch. The below grade dry pit contains two 7.5 hp pumps, isolation and check valves, and piping. The wet well and dry pit are within the 100-year floodplain and could be flooded. Power and control panels for the pump station are located uphill from the wet well along Calaroga Drive, above the 100-year floodplain.

The 2019 Sanitary Sewer Master Plan identified the need to increase capacity of each pump in the station by 70,000 gallons per day to convey peak wet weather flows. In 2021, a more in-depth analysis of Calaroga Sanitary Sewer Pump Station was performed to identify the size of new pumps and associated wet well needed (Calaroga Sanitary Sewer Pump Station Capacity, Carollo Engineers, Inc., March 2021). In 2022, alternatives for Calaroga Sanitary Sewer Pump Station were prepared and the City selected construction of a new wet well located adjacent to Calaroga Drive to mitigate flood events (Calaroga Sanitary Sewer Pump Station Alternatives Analysis, Carollo Engineers, Inc., February 2022). Under City project PW-22-05, the existing pump station will be replaced with a facility that is not subject to flooding during a 100-year event and has increased capacity to convey peak wet weather flows.

**2. Methods**

The subject tax lot and adjacent off-site areas were reviewed for the potential presence of regulated wetlands and waterways during the 2021 investigation period. Adjacent off-site areas were visually inspected from the subject parcel and the public right of way due to lack of access. The 2021 review determined that no wetlands were present on-site or adjacent to the subject tax lot, but a perennial stream did run along the north property boundary. A follow up site visit occurred on January 18, 2023 to flag the ordinary high water mark of the stream, which was then surveyed by the project survey team. Riparian buffer conditions were also documented during this period.

The wetland and waters review was conducted using the Level 2 Routine Delineation Method described in the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987) and further supported by the Regional Supplement (Supplement) to the Corps of Engineers Wetland Delineation



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Manual, Western Mountains, Valleys, and Coast Region (USACE 2010). This method requires the simultaneous presence of hydrophytic vegetation, hydric soils, and positive wetland hydrology in wetland delineations.

Chapter 32 of the West Linn community development code (CDC) regulates work in Water Resource Areas (WRA). CDC Chapter 2 defines WRAs as “*Any water resource or riparian area identified in the West Linn WRA Map and the adjacent area of varying widths, established pursuant to Chapter 32 CDC, in which development activities are restricted in order to protect the functions and values of the associated water resource.*” Based on this definition, and further guidance in the CDC, the WRA consists of the water resource (e.g., wetland or stream) and an associated buffer that varies in width depending on slope steepness (e.g., less than or greater than 25% slope), fish presence, and other potential factors per Table 32-2 of the CDC. Buffer widths can range between 65 and 200 feet, except for ephemeral streams that can have a minimum width of 15 feet. The minimum width for a riparian corridor starts at 100 feet regardless of slope. However, the CDC allows a decreased WRA width when ecological functions can be maintained at a level that is “qualitatively equal” to those provided by the WRA width required by code.

The following background resources were reviewed:

- West Linn WRA Map (May 2014)
- U.S. Fish and Wildlife (USFWS) National Wetland Inventory (NWI) On-Line Mapper
- U.S. Department of Agriculture (USDA) Web Soil Survey
- Oregon Department of Fish and Wildlife (ODFW) Fish Distribution On-Line Mapper

A tree survey was also conducted to inform review of project impacts associated with the City Community Tree Ordinance (CDC 8.500 – 8.798). Tree location and diameter at breast height (dbh) were recorded by the project surveyor. A DEA Ecologist conducted a site visit on July 3, 2023 to determine tree species and condition. The City’s list of heritage trees designated by the City Council was reviewed along with heritage tree designation criteria provided in CDC 8.710 to determine if heritage trees occur on or adjacent to the subject property or may potentially meet the criteria for designation as a heritage tree.

### **3. Existing Conditions Findings**

#### **3.1. Preliminary Information Review**

Reference materials noted in the methods section were reviewed prior to the field investigation to provide information regarding the possible presence of wetlands, water features, hydric soils (i.e., wetland soils), wetland hydrology, and site topography. This information revealed that hydric soils and/or wetlands are not mapped in the project vicinity. A perennial creek is mapped in the vicinity and West Linn WRA mapping (West Linn 2014) highlights the riparian corridor as a “significant” Goal 5 resource. ODFW maps the creek as providing rearing habitat to coho salmon (*Oncorhynchus kisutch*) and potentially supporting cutthroat trout (*Oncorhynchus clarkia*), up to the Calaroga Drive culvert crossing.

Based on a review of the City list of designated heritage trees, no heritage trees are currently designated on the subject parcel or nearby.



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### 3.2. Field Review

The pump station tax lot is situated in a moderate to steeply sloping ravine in a suburban wooded setting. Trillium Creek, a tributary to the Willamette River, flows along the confined ravine bottom (see attached Photo Log). Pump station facilities consist of a short access driveway and the existing pump station that is surrounded by chain link fence. These facilities may have been graded into the hillside or placed along a natural narrow bench adjacent to the top of the stream bank. Areas bordering the developed portion of the site contain a mix of native and non-native riparian vegetation. Native vegetation consisted of an overstory of black cottonwood (*Populus balsamifera*), and red alder (*Alnus rubra*), with red cedar (*Thuja plicata*) observed nearby. Native understory consists of sword fern (*Polystichum munitum*). Non-native species consisted of English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus armeniacus*). The ivy was mixed in with native vegetation and predominantly found along the edges of the access driveway and Calaroga Drive. The blackberry primarily occurred as a large patch along the east and south sides of the pump station.

Tree survey results are provided in Table 1. Tree identification numbers were designated by DEA and are shown on the existing conditions Figure 2. As previously noted, there are no mapped heritage trees on or near the project vicinity. Furthermore, none of the project trees had characteristics matching the criteria for heritage trees outlined in CDC 8.710 Heritage Trees.

**Table 1 Tree Survey Results**

TREE ID	TREE SPECIES	DBH (INCHES)	CONDITION (GOOD, FAIR, POOR)
01	Black cottonwood ( <i>Populus balsamifera</i> )	26	Fair (healthy growth, but girdled at base)
02	Black cottonwood ( <i>Populus balsamifera</i> )	26	Fair (healthy growth, but girdled at base)
03	Bigleaf maple ( <i>Acer macrophyllum</i> )	10	Good
04	Red alder ( <i>Alnus rubra</i> )	12	Good
05	Linden tree ( <i>Tilia</i> sp.)	12	Good (multi trunk w/ID06, tree topped per powerline maintenance, ivy growth but tree appears healthy)
06	Linden tree ( <i>Tilia</i> sp.)	12	Good (multi trunk w/ID05, tree topped per powerline maintenance, ivy growth but tree appears healthy)
07	Linden tree ( <i>Tilia</i> sp.)	14	Good
08	Wester redcedar ( <i>Thuja plicata</i> )	12	Good (pruned along one side per powerline maintenance, ivy growth but tree appears healthy)
09	Linden tree ( <i>Tilia</i> sp.)	12	Good (tree topped per powerline maintenance, ivy growth but tree appears healthy)
10	Red alder ( <i>Alnus rubra</i> )	18	Fair (tree topped per powerline maintenance, heavy ivy growth, dead limbs)



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Field review determined that no wetlands were present on-site or adjacent to the subject tax lot, but a perennial stream (Trillium Creek) did run along the north property boundary. The ordinary high-water mark of the stream was flagged based on indicators of scour and presence/absence of persistent vegetation along the bank line. The stream is a relatively steep perennial stream with cobble, gravel, and silt substrates. Rock grade control structures are present below the culvert outfall at Calaroga Drive, creating a series of step pools. The south bank drops fairly steeply from the edge of the developed pump station site, with OHW occurring 3 to 4 feet below the top of bank.

The field-verified WRA consists of Trillium Creek and an existing vegetated buffer that is less than the required 100-foot width due to surrounding development. The entire tax parcel is entirely within the first 50 feet of the regulated buffer, as measured perpendicular from OHW to the southwest property corner. The off-site portion of the regulated 100-foot-wide WRA extends into unimproved and improved right-of-way and adjacent residential properties. Figure 2 displays the tax parcel boundaries, the existing on-site development (as described above) and the buffer within the project limits of disturbance. Ecological functions of the WRA are supported by the existing native vegetation, but are reduced as a result of existing development (i.e. pavement) and non-native invasive vegetation that is adversely affecting native species. Additional review of ecological functions is provided in Section 4.

#### **4. Proposed Work, Riparian Buffer Impacts, Mitigation, and Ecological Functions**

##### **4.1. Proposed Work**

The City is proposing to rebuild the pump station, elevating it above the 100 year flood elevation. This will include installation of a gabion retaining wall, back filling the area behind the wall to a level ground surface and constructing the new pump station. A manhole will be left in place where the current pump station resides. The existing access driveway will also be left in place. No work is proposed below the OHW mark of Trillium Creek.

##### **4.2. Proposed Tree and Riparian Buffer Impacts**

Table 2 lists the trees proposed to be removed as a result of the project. All tree removal is needed because the trees occur within the development footprint of the project.

**Table 2 Tree Proposed for Removal**

<b>TREE ID</b>	<b>TREE SPECIES</b>	<b>DBH (INCHES)</b>	<b>REASON FOR REMOVAL</b>
04	Red alder ( <i>Alnus rubra</i> )	12	In proposed development footprint
05	Linden tree ( <i>Tilia sp.</i> )	12	In proposed development footprint
06	Linden tree ( <i>Tilia sp.</i> )	12	In proposed development footprint
07	Linden tree ( <i>Tilia sp.</i> )	14	In proposed development footprint
08	Wester redcedar ( <i>Thuja plicata</i> )	12	In proposed development footprint





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TREE ID	TREE SPECIES	DBH (INCHES)	REASON FOR REMOVAL
09	Linden tree ( <i>Tilia sp.</i> )	12	In proposed development footprint

Permanent impacts to 2,445 square feet (sq. ft.) of riparian buffer will occur as a result of the proposed development (i.e., pump station and gabion wall) (Figure 3). No work will occur north of the existing driveway and pump station, thus avoiding impacts along the creek bank and within the creek.

#### 4.3. Proposed Riparian Buffer Mitigation

CDC 32.090(B and C) specifies a preference for on-site mitigation and requires a mitigation ratio for impacts to previously disturbed buffer of 0.5 square feet of mitigation for every square foot of impact. The entire subject parcel is considered previously disturbed. The project is proposing on-site mitigation in the form of enhancement along the east side of the property where no development is proposed. This area contains a large patch of invasive Himalayan blackberry and English ivy that will be removed and enhanced with native riparian forest plantings. The mitigation/enhancement plantings will be extended into the adjacent property because sufficient square footage is not available on the subject parcel. Per review with the City Planning Department, the adjacent parcel will be considered on-site due to the contiguity with the subject parcel mitigation. The adjacent parcel contains no trees within the proposed mitigation area and is dominated by an invasive Himalayan blackberry thicket.

Proposed mitigation is shown on the attached Planting Plan design sheets (L01 and L02). The required minimum area of mitigation, based on the CDC mitigation ratio, is 1,223 sq. ft. (0.5 x 2,445 sq ft of impact). However, due to the CDC tree and shrub quantity and spacing requirements, an additional 464 sq. ft. of planting area is required to accommodate all plantings. Therefore, the total proposed mitigation area is 1,697 sq. ft, which includes 858 sq. ft. on the subject parcel and 839 sq. ft. on the adjacent parcel. Proposed mitigation design is attached and has been prepared in accordance with CDC 32.100 Revegetation Plan Requirements.

#### 4.4. Ecological Functions

The City of West Linn development code permits limited development within the WRA when in compliance with approval criteria for the alternate review process (West Linn CDC 32.080). One of these criteria requires maintaining the level of ecological functions provided by the specific WRA, which in this case is the Riparian Corridor. West Linn CDC defines a Riparian Corridor as an area within and adjacent to a WRA providing vegetative, forested and habitat values. The West Linn CDC Table 32-4 lists WRA ecological functions and provides examples of landscape features that may support each function. Table 3 compares ecological functions for the site under existing and proposed conditions. The proposed mitigation is designed to maintain the ecological functions at the site.



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**Table 3. Summary of Ecological Functions Under Existing and Proposed Conditions**

Ecological Function	Landscape Features Potentially Providing the Function	Existing Conditions	Proposed Enhanced Conditions
Stream flow moderation and/or water storage	A wetland or other water body with a hydrologic connection to a stream or flood area, the presence of fallen trees and density of vegetation in the WRA that slows the flow of storm water and increases its ability to retain sediment and infiltrate storm water, and the porosity of the WRA's surface to enable it to infiltrate storm water.	No wetlands or other water body is present other than Trillium Creek. Existing pavement increases direct runoff to the stream. This is offset to a degree by existing canopy cover. Presence of invasive English ivy and Himalayan blackberry on subject property is stressing existing vegetation and could eventually reduce the health and canopy cover, thereby adversely affecting this function. Adjacent property consists of blackberry thicket (i.e., little canopy cover).	Replacement of the ivy and blackberry with native shrubs and trees will increase canopy cover which will help moderate runoff and allow for more infiltration. Ivy and blackberry stressors will be removed.
Sediment or pollution control	Vegetation within 100 feet of a WRA on gentle slopes and up to 200 feet of a WRA if the slope is greater than 25%. The presence of fallen trees and other material that slows the flow of water and increase the ability to retain sediment, absorb pollutants and infiltrate storm water; the composition and density of vegetation; slope; and soils.	Current ground cover is minimal, with a high percent of bare ground under the existing canopy on the subject property. Canopy cover on adjacent lot is lacking. These factors result in greater potential for sediment runoff. However, erosion was not observed.	The mitigation plan proposes planting a variety and density of plants compared with existing conditions. Canopy cover overall will be increased. This will help prevent erosion and retain sediment and slow the flow of storm water.
Bank stabilization	Root masses, existing large rocks or anchored large wood along the stream bank.	The existing bank appears stable. Several grade control weirs occur in the stream, which help to reduce bank erosion. Riparian vegetation along the bank is fairly limited due to the adjacent driveway. The adjacent property has some native shrubs directly along the bank but only invasive blackberry just back from the bank.	Construction work areas will avoid existing native vegetation along the banks. Invasive plants near the streambank will be removed by hand and exposed soils will be replanted with native shrubs and trees and temporarily stabilized with jute matting.
Large wood recruitment for a fish bearing section of stream	Forest canopy within 50 to 150 feet of a fish bearing stream.	A few large trees within the subject property occur directly along the bank. All other trees are relatively small and/or have been topped due to power line maintenance. Thus, existing large wood recruitment from the subject and adjacent properties is fairly limited.	The West Linn WRA Map shows Trillium Creek as a fish-bearing stream within the study area. Oregon Department of Fish and Wildlife maps the creek as fish bearing up to the Calaroga Drive culvert crossing. Six trees beyond 25 feet from the creek will be removed from the proposed development footprint and



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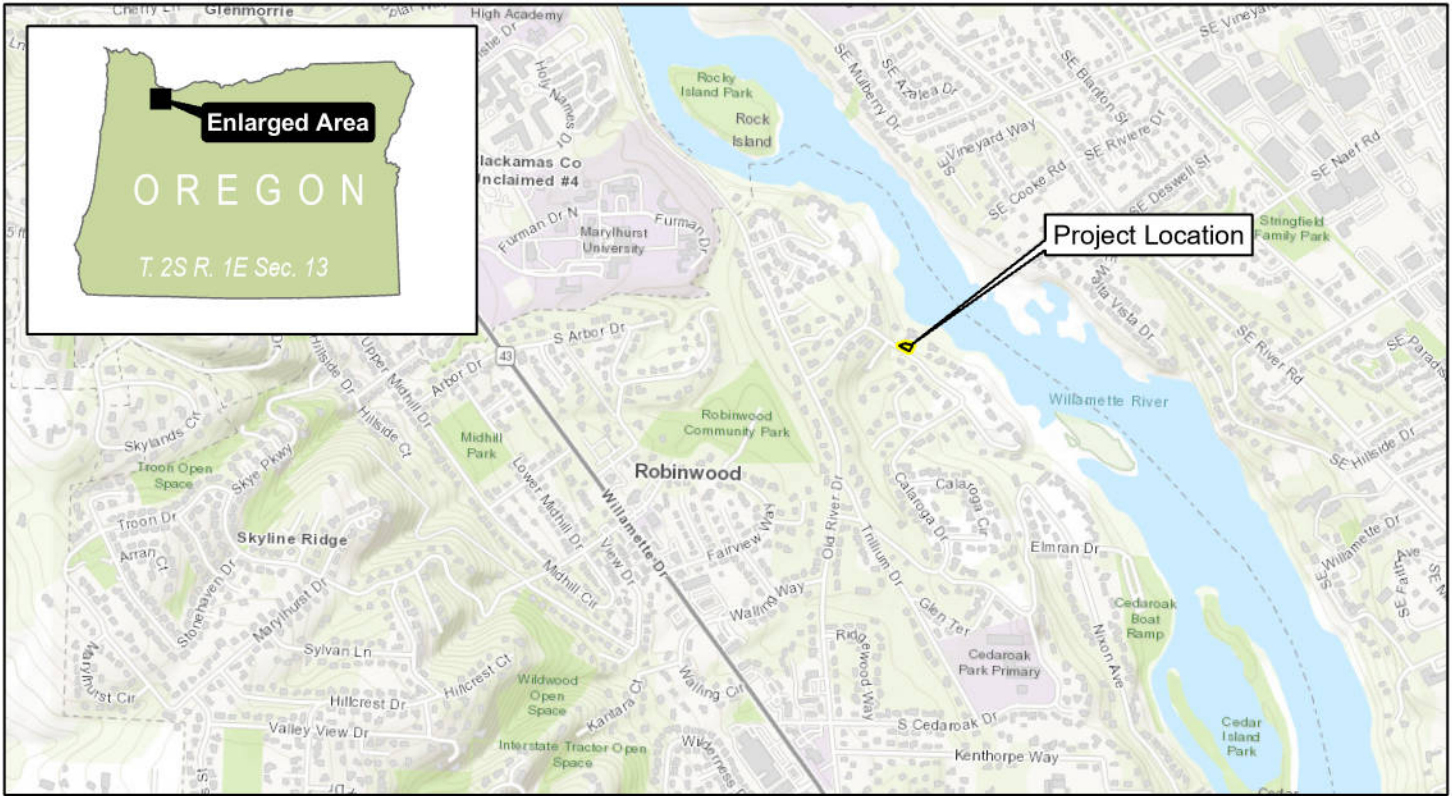
**TO:** Erich Lais (West Linn)

**SUBJECT:** Calaroga Pump Station Natural Resources Site Review

Ecological Function	Landscape Features Potentially Providing the Function	Existing Conditions	Proposed Enhanced Conditions
			replanted. Existing trees to remain will continue to provide forest canopy within 50 feet of the stream. Forest canopy will increase as mitigation trees grow to maturity.
Organic material sources	Forest canopy or woody vegetation within 100 feet of a water resource; or within a flood area.	Canopy coverage is high on the subject parcel and absent on the adjacent parcel.	See Large Wood Recruitment above.
Shade (water temperature moderation) and microclimate	Forest canopy or woody vegetation within 100 feet of the water resource. Roughly 300 feet of continuous canopy for microclimate.	See Organic Material Sources above.	See Large Wood Recruitment above.
Stream flow that sustains in-stream and adjacent habitats	Seasonal or perennial flow.	Trillium creek is a perennial creek.	The project design includes use of gabion walls and porous rock that will allow rainfall to infiltrate into the ground and sustain in-stream and adjacent habitats.
Other terrestrial habitat	Forest canopy natural vegetation contiguous to and within 100 to 300 feet of the water resource.	Site has high canopy coverage but is developed (paved) and/or has high percentage of invasives in the understory.	The site will be enhanced with native riparian forest plantings supporting terrestrial habitat.

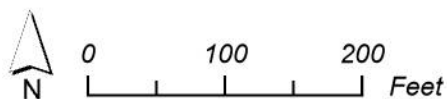
**Attachments:**

- Figures
  - Figure 1, Vicinity Map
  - Figure 2, Existing Conditions
  - Planting Plan Design Sheets (L01 and L02)
- Photo Log



ESRI World Topo Map, World Imagery

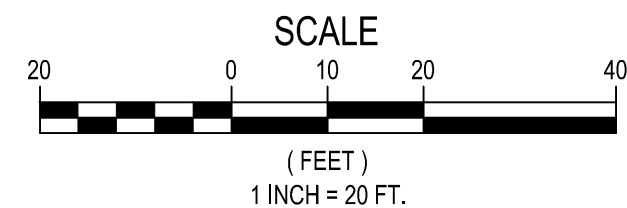
Figure 1  
Vicinity





**EXISTING TREES**

TREE ID	DBH	SPECIES
01	26"	Black Cottonwood ( <i>Populus balsamifera</i> )
02	26"	Black Cottonwood ( <i>Populus balsamifera</i> )
03	10"	Bigleaf Maple ( <i>Acer macrophyllum</i> )
04	12"	Red Alder ( <i>Alnus rubra</i> )
05	12"	Linden Tree ( <i>Tilia sp.</i> )
06	12"	Linden Tree ( <i>Tilia sp.</i> )
07	14"	Linden Tree ( <i>Tilia sp.</i> )
08	12"	Western Redcedar ( <i>Thuja plicata</i> )
09	12"	Linden Tree ( <i>Tilia sp.</i> )
10	18"	Red Alder ( <i>Alnus rubra</i> )



REVIEW BY	DATE

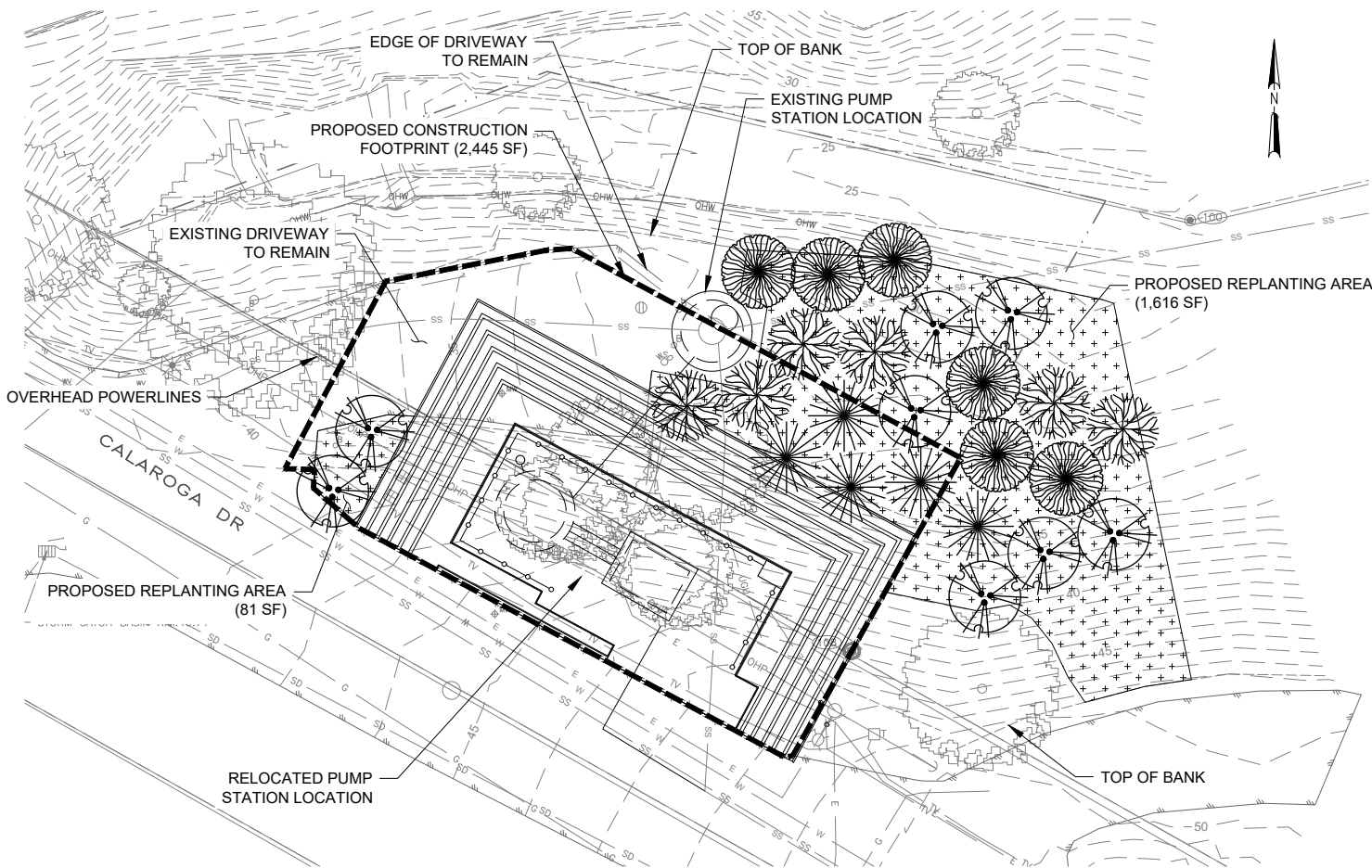
**PRELIMINARY**

E. ROSENTHAL  
 XXX  
 T. DANISCH

07/05/23

CARO-4021

**Figure 2**



**MITIGATION AND PLANTING REQUIREMENTS:**

**REQUIRED MINIMUM ENHANCEMENT AREA**

DISTURBANCE TYPE	DISTURBANCE AREA	ENHANCEMENT REPLACEMENT MULTIPLIER	REQUIRED ENHANCEMENT AREA
PREVIOUSLY DISTURBED AREA*	2,445 SF	0.5	1,223 SF
TOTAL MINIMUM REQUIRED ENHANCEMENT AREA = 1,223 SF			

\* ENTIRE SUBJECT PARCEL CONSIDERED TO BE PDA DUE TO PREVIOUS PUMP STATION DEVELOPMENT

**TREE AND SHRUB PLANTING REQUIREMENTS**

PREVIOUSLY DISTURBED AREA	REQUIRED SHRUBS	PROPOSED SHRUBS	REQUIRED TREES	PROPOSED TREES
2,445 SF	PLANTED AT A RATE OF 25 SHRUBS PER EVERY 500 SF OF PDA: 2,445 SF / 500 SF = 4.89 X 25 SHRUBS = 122.25 SHRUBS	123**	PLANTED AT A RATE OF 5 TREES PER EVERY 500 SF OF PDA: 2,445 SF / 500 SF = 4.89 X 5 TREES = 24.45 TREES	25

\*\* 123 SHRUBS PLANTED WITH TRIANGULAR SPACING AT 48" O.C. REQUIRES A PLANTING AREA OF 1,697 SF

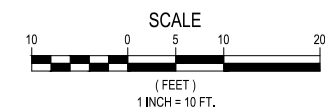
**PLANTING NOTES:**

- PRIOR TO INSTALLATION OF PLANT MATERIAL, ALL INVASIVE SPECIES WITHIN PLANTING AREA SHALL BE REMOVED MANUALLY.
- ALL PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE OF PESTS AND DISEASE. STANDARDS SET FORTH IN "AMERICAN STANDARD FOR NURSERY STOCK" REPRESENT GUIDELINE SPECIFICATIONS ONLY AND SHALL CONSTITUTE MINIMUM QUALITY REQUIREMENTS FOR PLANT MATERIAL.
- REFER TO DETAILS FOR REQUIREMENTS FOR PLANTING SOILS WITHIN PLANTING PITS.
- ALL TREES SHALL HAVE A STRAIGHT TRUNK AND FULL HEAD.
- ALL MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT BEFORE, DURING, AND AFTER INSTALLATION.
- ALL TREE AND SHRUB PLANTING PITS SHALL BE MULCHED 3" IN DEPTH AND 18" IN DIAMETER WITH NON-CHEMICALLY TREATED COMPOSTED BARK OR LEAVES AS SHOWN IN THE TREE/SHRUB PLANTING INSTALLATION DETAIL.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL AVOID DAMAGE TO ALL UTILITIES DURING THE COURSE OF THE WORK. LOCATIONS OF EXISTING BURIED UTILITY LINES SHOWN ON THE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AND ARE TO BE CONSIDERED APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR 1) TO VERIFY THE LOCATIONS OF UTILITY LINES AND ADJACENT TO THE WORK AREA 2) TO PROTECT OF ALL UTILITY LINES DURING THE CONSTRUCTION PERIOD 3) TO REPAIR ANY AND ALL DAMAGE TO UTILITIES, STRUCTURES, SITE APPURTENANCES, ETC. WHICH OCCURS AS A RESULT OF THE CONSTRUCTION.
- SOIL WITHIN TEMPORARY CONSTRUCTION AREAS SHALL BE DECOMPACTED TO AN 18" DEPTH IN PLANTING AREAS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON THESE PLANS BEFORE PRICING THE WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE COVERAGE OF ALL PLANTING BEDS AS SHOWN ON THE PLANS AT SPACING SHOWN GRAPHICALLY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULLY MAINTAINING (INCLUDING BUT NOT LIMITED TO: WATERING, MULCHING, FERTILIZING, PRUNING, REPLACING) ALL OF THE PLANT MATERIALS FOR A PERIOD OF ONE YEAR. AT THE END OF THE MAINTENANCE PERIOD, THE WORK MUST BE ACCEPTED IN FULL BY THE OWNER.
- ANY PLANT MATERIAL WHICH IS DISEASED, DISTRESSED, DEAD, OR REJECTED (PRIOR TO SUBSTANTIAL COMPLETION) SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY, AND SIZE AND MEETING ALL PLANT LIST SPECIFICATIONS.
- THE CONTRACTOR SHALL COMPLETELY GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR. THE CONTRACTOR SHALL PROMPTLY MAKE ALL REPLACEMENTS DURING THE NORMAL PLANTING SEASON.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY SCHEDULE AND PROTECTION BETWEEN DELIVERY AND PLANTING TO MAINTAIN HEALTHY PLANT CONDITIONS.
- THE CONTRACTOR IS ENCOURAGED TO COMPLETE TEMPORARY OR PERMANENT MULCHING IN STAGES FOR SOIL STABILIZATION AS AREAS ARE COMPLETED AFTER GRADING.
- THIS PLAN DOES NOT PRESENT ANY TEMPORARY STABILIZATION MEASURES REQUIRED FOR EROSION CONTROL. SEE EROSION AND SEDIMENT CONTROL PLANS.
- BARE ROOT TREES SHALL BE PLANTED BETWEEN DECEMBER 1ST AND FEBRUARY 28TH. POTTED PLANTS SHALL BE PLANTED BETWEEN OCTOBER 15TH AND APRIL 30TH.
- THOROUGHLY "WATER-IN" ALL PLANT MATERIALS WITHIN 6 HOURS FOLLOWING INSTALLATION.

**PLANT SCHEDULE:**

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	QTY
<b>TREES</b>					
	ACER CIRCINATUM	VINE MAPLE	1/2" CAL. B&B	AS SHOWN	8
	ACER MACROPHYLLUM	BIGLEAF MAPLE	1/2" CAL. B&B	AS SHOWN	6
	ALNUS RUBRA	RED ALDER	1/2" CAL. B&B	AS SHOWN	6
	THUJA PLICATA	WESTERN REDCEDAR	1/2" CAL. B&B	AS SHOWN	5
TOTAL PROPOSED TREES = 25					
<b>SHRUBS AND GROUNDCOVER</b>					
<b>SHRUBS</b>					
	POLYSTICHUM MUNITUM	WESTERN SWORD FERN	1 GAL. CONT., 12" HT. MIN.	48" O.C.	41
	SAMBUCUS RACEMOSA	RED ELDERBERRY		48" O.C.	41
	SYMPHORICARPOS ALBUS	COMMON SNOWBERRY		48" O.C.	41
TOTAL PROPOSED SHRUBS = 123					
<b>NATIVE SEED MIX</b>					
	ELYMUS GLAUCUS / BLUE WILDRYE		PLS SPECIFIED RATE LB/AC (PLS**)	APPLICATION RATE LB/AC (PLS*)	
	HORDEUM BRACHYANTHERUM / MEADOW BARLEY		26.1	43	0.04 AC
	BROMUS CARINATUS / CALIFORNIA BROME		4.3		

\* PLS = PURE LIVE SEED



PROJECT: CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT  
 WEST LINN, OREGON  
 SHEET TITLE: PLANTING PLAN

BY: NO. DATE: REVISION:

90% PLANS

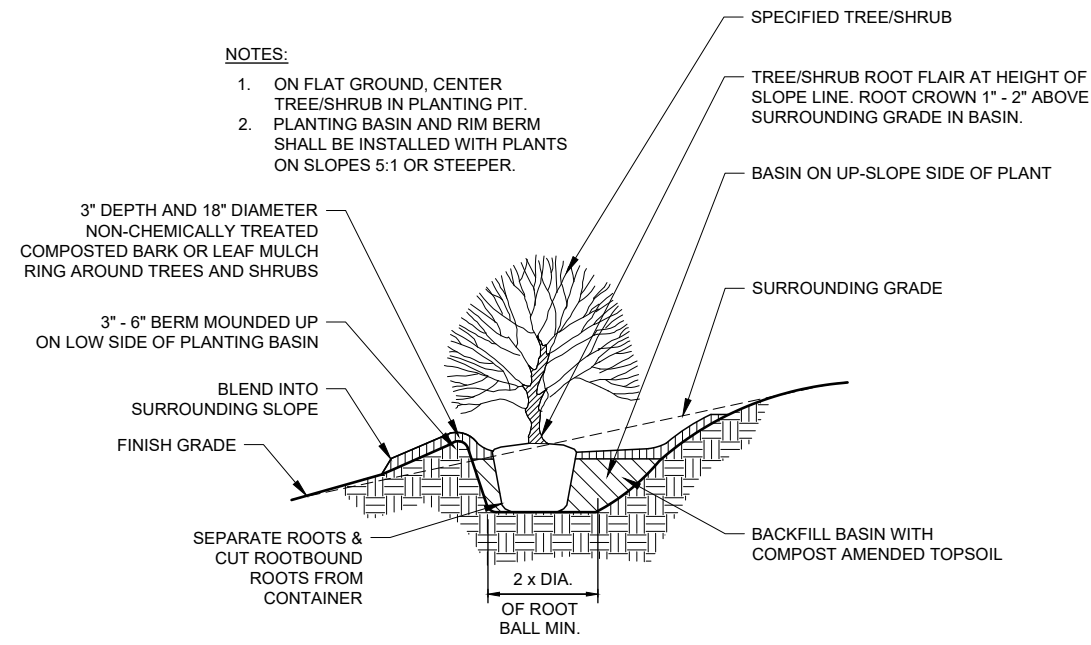
PRELIMINARY

DATE: 09/20/23  
 DESIGN: T. DANISCH  
 DRAWN: K. ROPERT, DANISCH

SHEET NO.

**L01**

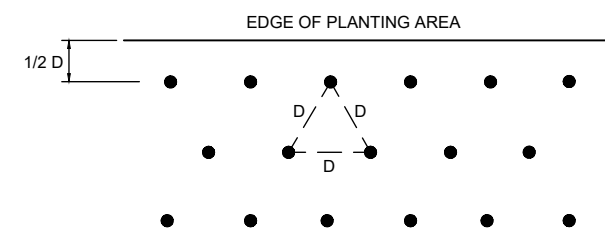
PROJECT NO. CAR0000-4021



NOTES:

1. ON FLAT GROUND, CENTER TREE/SHRUB IN PLANTING PIT.
2. PLANTING BASIN AND RIM BERM SHALL BE INSTALLED WITH PLANTS ON SLOPES 5:1 OR STEEPER.

TREE/SHRUB PLANTING INSTALLATION  
NOT TO SCALE



NOTE:  
D = PLANT SPACING.  
(SEE PLANTING SCHEDULE, L01)  
LOCATE PLANTS SPACED EQUAL DISTANCE (D) FROM EACH OTHER AS SHOWN.

TYPICAL SHRUB SPACING DETAIL - PLAN VIEW  
NOT TO SCALE

PROJECT  
CALAROGA SANITARY SEWER PUMP  
STATION REPLACEMENT PROJECT  
WEST LINN, OREGON

SHEET TITLE  
PLANTING DETAILS

NO.	DATE	REVISION	BY

90% PLANS

PRELIMINARY

DATE: 09/20/23  
DESIGN: T. DANISCH  
DRAWN: K. ROPER/T. DANISCH

SHEET NO.

L02



**Photo 1:** Looking south at slope where proposed pump station to be placed. Bare ground, English ivy, and a few sword ferns. Linden tree in mid-ground. (7/3/23)



**Photo 2:** Looking west, upstream, at Trilium Creek and very narrow riparian fringe between creek and existing pump station driveway. (1/18/23)





**Photo 3:** Cottonwood tree along creek bank between driveway and creek. The tree has been girdled presumably by beaver. Protective fencing not placed low enough. Healthy green growth was observed, but tree may eventually die. (7/3/23)



**Photo 4:** Blackberry thicket on adjacent property to be replanted with native plants as part of mitigation. (7/3/23)

# Appendix D

Robinwood Neighborhood Association Notice  
Materials

**AFFIDAVIT OF MAILING**

I, Susanna Julber, as the applicant/representative for the Colunga Proposition project, hereby certify that on this 22<sup>nd</sup> day of June, 2023 a true and correct copy of the notice of neighborhood/applicant meeting, marked as Exhibit "A" attached hereto and by this reference incorporate herein, was mailed to those referenced on Exhibit "B" accordance with the requirements of the City of West Linn Community Development Code section 99.038.

I further certify that the addresses shown on said Exhibit "B" are their regular addresses as determined from the books and records of the Clackamas County Department of Assessment and Taxation and that said Notices were placed in the United States Mail with postage fully prepared thereon.

Susanna Julber  
Applicant's/Representative's Signature

6/22/23  
Date

STATE OF OREGON            )  
  )SS  
COUNTY OF DESCHUTES    )

On this 22 day of JUNE, 2023, before me, the undersigned, a notary public in and for the said county and state, personally appeared the within-named, SUSANNA JULBER who is known to me to be the identical individual described herein and who executed the same freely and voluntarily.

Seal:

IN TESTIMONY WHEREOF, I have hereunto set my hand and seal the day and year last above written.



Adelita Malicay  
Notary Public



550 NW Franklin Avenue, Suite 428  
Bend, Oregon 97703  
Tel: 541.279.2465

Exhibit A  
Example of  
Mailing

June 22, 2023

VARITZ WILLIAM R TRUSTEE  
17828 ROBIN VIEW CT  
WEST LINN, OR 97068

R.E.: City of West Linn Calaroga Wastewater Pump Station Relocation Project Robinwood Neighborhood Association Meeting July 11, 2023, 7:00 p.m., Robinwood Station Community Center, 3706 Cedar Oak Drive, West Linn, OR 97068

Carollo Engineers and Consor SPC have been retained by the City of West Linn to design a project to relocate the existing Calaroga Wastewater Pump Station from its current location to another area on the same property, located at 3821 S. Calaroga Drive, to provide safe access to the pump station during the 100-year flood event and to increase capacity. This wastewater pump station directly serves the surrounding properties and neighborhood.

We are preparing a Conditional Use and Floodplain Development permit, and will be discussing the proposal with members of the Robinwood Neighborhood Association and with property owners residing within 500 feet of the property at the **July 11, 2023** Robinwood Neighborhood Association meeting, starting at 7:00 p.m. Please note the proposal may not be the only item discussed at the Neighborhood Association meeting. The location of the proposed project is shown on the attached map.

**PROJECT GOALS:**

- Relocate the pump station farther away from the boundaries of Trillium Creek
- Provide safe access to the pump station during a 100-year flood event
- Provide an area for safe parking for City maintenance workers
- Increase Pump Station capacity
- Provide minimal disturbance to the neighborhood

We look forward to discussing the project with you in person. Project team engineers and staff from City of West Linn Public Works Department will be attending to answer your questions and provide a project overview.

Sincerely,

Susanna Julber, AICP, Senior Project Manager  
[susanna.julber@consoreng.com](mailto:susanna.julber@consoreng.com)

Cc: Corianne Burnett, Project Manager, Carollo Engineers

Subject Site: 3821 S. Calaroga Drive, West Linn, OR 97068

Map/ Tax Lot: 21E13CA01101

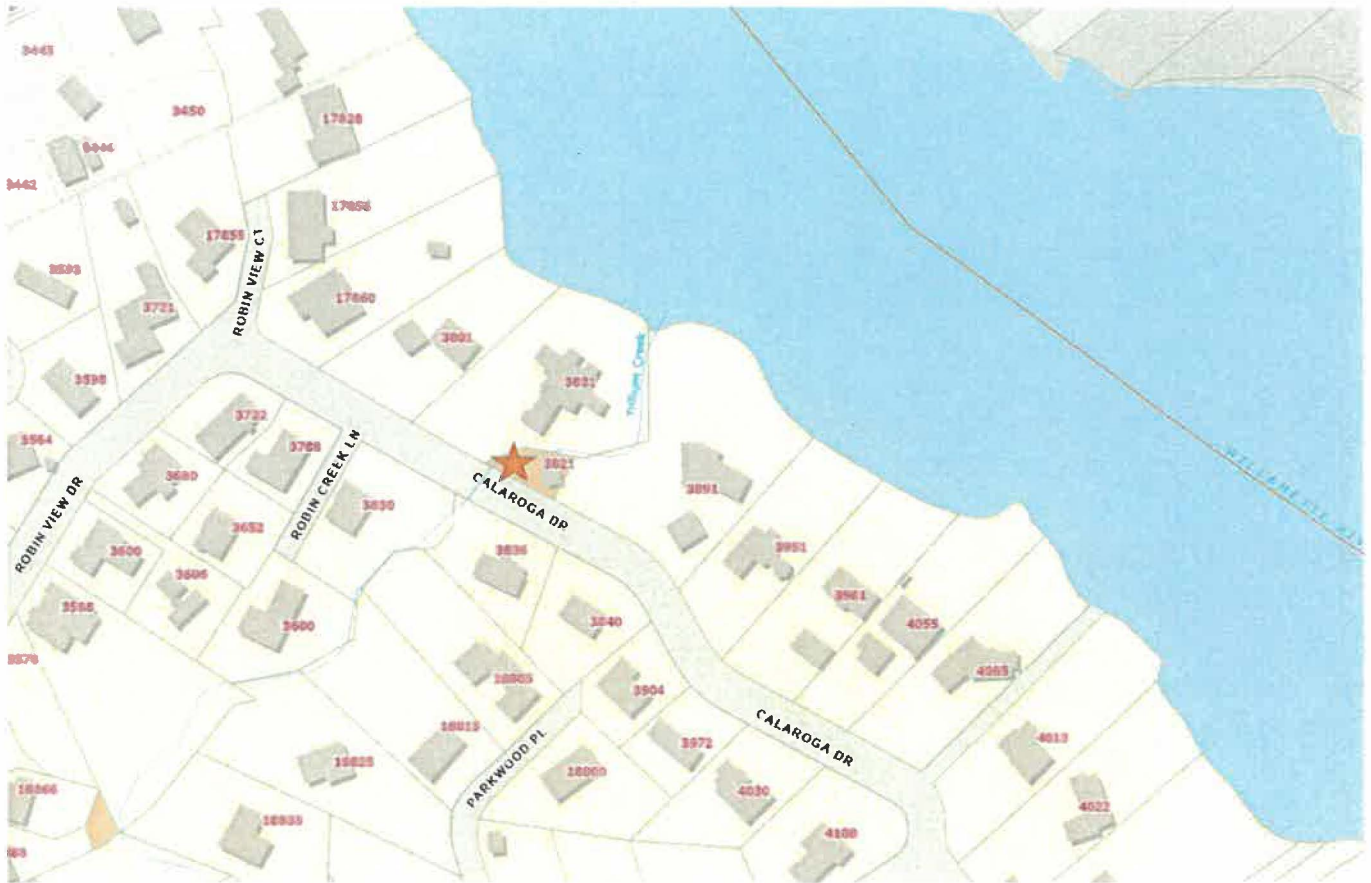


Exhibit B

VARITZ WILLIAM R TRUSTEE  
17828 ROBIN VIEW CT  
WEST LINN, OR 97068

WILHELM JOSEPH R TRUSTEE  
17856 ROBIN VIEW CT  
WEST LINN, OR 97068

WELLS HILARY A  
17855 ROBIN VIEW CT  
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3721 ROBIN VIEW DR  
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CANBY, OR 97013

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Kevin Bryck  
Secretary, Robinwood Neighborhood  
Association  
3753 Kenthorpe  
WEST LINN, OR 97068

Susanna Julber, Consor  
550 NW Franklin Avenue, Suite 428  
Bend, Oregon 97703

Anthony Bracco, RNA President  
2716 Robinwood Way  
West Linn, OR 97068

**AFFIDAVIT OF MAILING**

I, Susanna Julber, as the applicant/representative for the Calwaga Redevelopment project, hereby certify that on this 22nd day of June, 2023 a true and correct copy of the notice of neighborhood/applicant meeting, marked as Exhibit "A" attached hereto and by this reference incorporate herein, was mailed to those referenced on Exhibit "B" accordance with the requirements of the City of West Linn Community Development Code section 99.038.

I further certify that the addresses shown on said Exhibit "B" are their regular addresses as determined from the books and records of the Clackamas County Department of Assessment and Taxation and that said Notices were placed in the United States Mail with postage fully prepared thereon.

Susanna Julber  
Applicant's/Representative's Signature

6/22/23  
Date

STATE OF OREGON            )  
  )SS  
COUNTY OF DESCHUTES    )

On this 22 day of JUNE, 2023, before me, the undersigned, a notary public in and for the said county and state, personally appeared the within-named, SUSANNA JULBER who is known to me to be the identical individual described herein and who executed the same freely and voluntarily.

Seal:

IN TESTIMONY WHEREOF, I have hereunto set my hand and seal the day and year last above written.



Adelita Malicay  
Notary Public





550 NW Franklin Avenue, Suite 428  
Bend, Oregon 97703  
Tel: 541.279.2465

*Exhibit A  
Example of  
Mailing*

June 22, 2023

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**PROJECT GOALS:**

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We look forward to discussing the project with you in person. Project team engineers and staff from City of West Linn Public Works Department will be attending to answer your questions and provide a project overview.

Sincerely,

Susanna Julber, AICP, Senior Project Manager  
[susanna.julber@consoreng.com](mailto:susanna.julber@consoreng.com)

Cc: Corianne Burnett, Project Manager, Carollo Engineers

Subject Site: 3821 S. Calaroga Drive, West Linn, OR 97068

Map/ Tax Lot: 21E13CA01101



Exhib. F 3

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Susanna Julber, Consor  
550 NW Franklin Avenue, Suite 428  
Bend, Oregon 97703

Anthony Bracco, RNA President  
2716 Robinwood Way  
West Linn, OR 97068

**AFFIDAVIT OF POSTING**

I, Corianne Burnett, the applicant/representative for the Calaroga Pump Station project, hereby certify that on this 23 day of June, 2023, a sign for the neighborhood/applicant meeting was posted on the subject property in accordance with the requirements of the City of West Linn Community Development Code section 99.038.

Corianne Burnett  
Applicant's/Representative's Signature

6-23-23  
Date

STATE OF OREGON            )  
  )SS  
COUNTY OF MULTNOMAH )

On this 23 day of June, 2023, before me, the undersigned, a notary public in and for the said county and state, personally appeared the within-named, Corianne Burnett who is known to me to be the identical individual described herein and who executed the same freely and voluntarily.

Seal:

IN TESTIMONY WHEREOF, I have hereunto set my hand and seal the day and year last above written.



Amelie  
Notary Public

## **NEIGHBORHOOD MEETING NOTICE**

# **CONDITIONAL USE PERMIT AND FLOODPLAIN DEVELOPMENT PERMIT TO RELOCATE EXSITING CALAROGA WASTEWATER PUMP STATION**

### **MEETING INFORMATION:**

**DATE: TUESDAY, JULY 11**

**TIME: 7:00 P.M.**

**LOCATION: ROBINWOOD STATION COMMUNITY CENTER,  
3706 CEADAROAK DRIVE, WEST LINN, OR 97068, AS PART OF THE  
ROBINWOOD NEIGHBORHOOD ASSOCIATION REGULAR MEETING**

### **CONTACT INFORMATION:**

**SUSANNA JULBER, [Susanna.Julber@consoreng.com](mailto:Susanna.Julber@consoreng.com), (541) 279-2465**

June 8, 2023

Anthony Bracco, RNA President  
2716 Robinwood Way  
West Linn, OR 97068

Kevin Bryck, RNA Secretary  
3753 Kenthorpe Way  
West Linn, OR 97068

R.E.: City of West Linn Calaroga Wastewater Pump Station Relocation Project Robinwood Neighborhood Association Meeting Request

Dear Mr. Bracco and Mr. Bryck,

Carollo Engineers and Consor SPC have been retained by the City of West Linn to design a project to relocate the existing Calaroga Wastewater Pump Station from its current location to another area on the same property, located at 3821 S. Calaroga Drive, to provide safe access to the pump station during the 100-year flood event and to increase capacity. This wastewater pump station directly serves the surrounding properties and neighborhood.

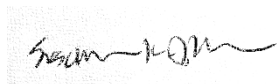
We are preparing a Conditional Use and Floodplain Development permit; before finalizing an application to the City's Planning Department, we would like to discuss the proposal with members of the Robinwood Neighborhood Association and with property owners residing within 500 feet of the property. Our preferred date is **July 11, 2023**, although the City's code allows you to determine your preferred date and time. If after 20 days from the date of this letter we have not heard from you with a preferred meeting date, we will schedule a separate meeting, in accordance with the City's notification requirements. The location of the proposed project is shown on the attached map.

#### PROJECT GOALS:

- Relocate the pump station farther away from the boundaries of Trillium Creek
- Provide safe access to the pump station during a 100-year flood event
- Provide an area for safe parking for City maintenance workers
- Increase Pump Station capacity
- Provide minimal disturbance to the neighborhood

We look forward to discussing the project with you in person. Project team engineers and staff from City of West Linn Public Works Department will be attending to answer your questions and provide a project overview.

Sincerely,

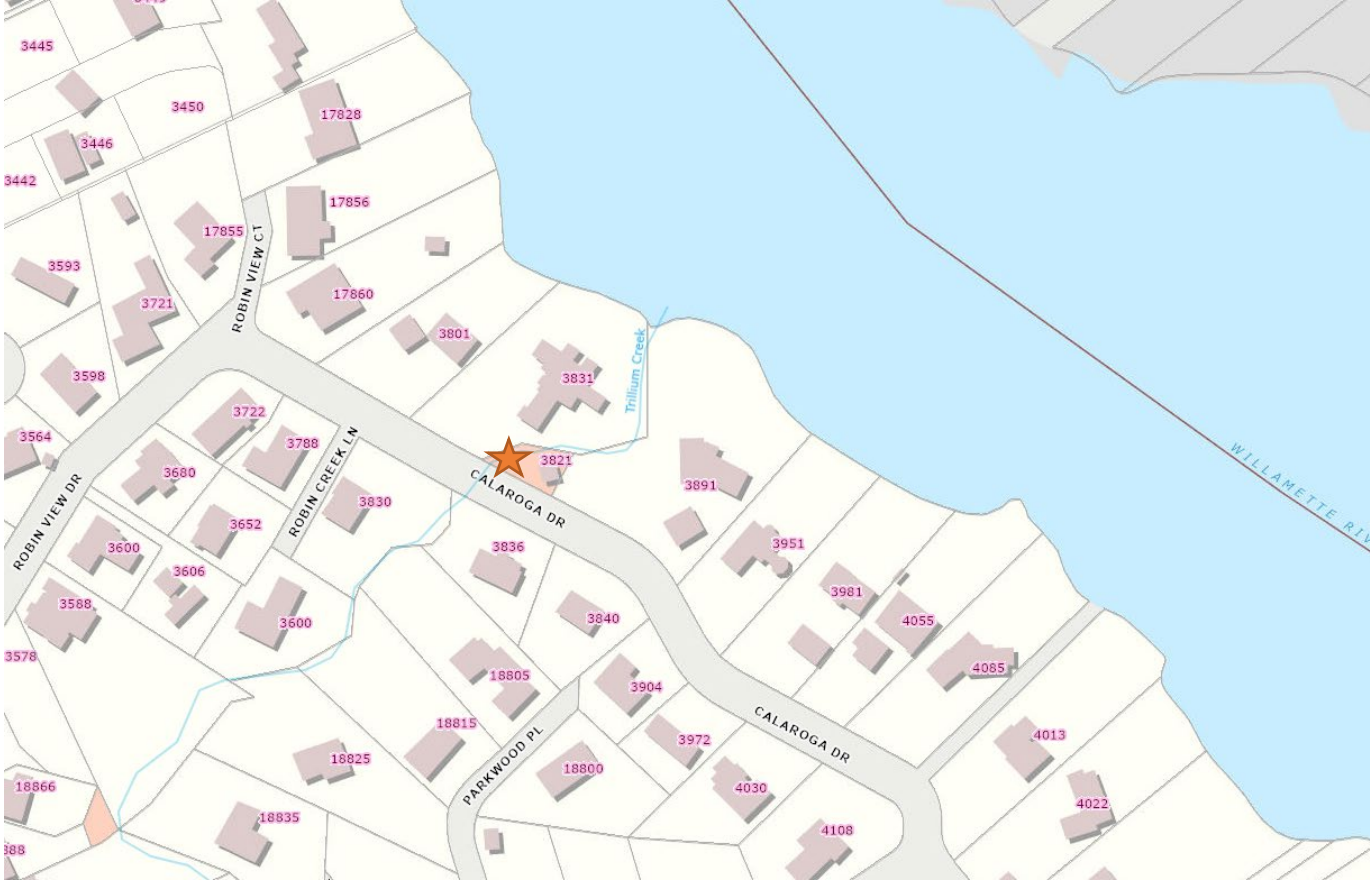


Susanna Julber, AICP, Senior Project Manager  
[susanna.julber@consoreng.com](mailto:susanna.julber@consoreng.com)

CC: Corianne Burnett, Project Manager, Carollo Engineers  
Maryna Asuncion, Associate Engineer, City of West Linn

Subject Site: 3821 S. Calaroga Drive, West Linn, OR 97068

Map/ Tax Lot: 21E13CA01101





**From:** [Susanna Julber](#)  
**To:** [RNASecretary](#)  
**Cc:** [Corianne Hart](#); [Asuncion, Maryna](#); [Katie Wilson \(Koellermeier\)](#)  
**Subject:** Copy of July 11 Calaroga Pump Station Relocation Presentation  
**Date:** Monday, July 17, 2023 12:11:26 PM  
**Attachments:** [ce\\_logo\\_240x46\\_ddfcf290-2d69-4d4c-a5c7-ee3ac33e0e44.png](#)  
[Calaroga NA Meeting 20230711 Powerpoint.pdf](#)

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Hello Kevin,

I hope you're doing well. I went to send the PowerPoint presentation to the folks who attended the meeting, but only 4 people provided their email addresses. Would you be able to send this to your NA email distribution list, if you have one?

Thank you, Susanna

**Susanna Julber**, AICP (She/Her/Hers)

SENIOR ASSOCIATE

o: +1.541.279.2465

m: +1.541.419.4009



[consoreng.com](http://consoreng.com)

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# City of West Linn

## Calaroga Sanitary Sewer Pump Station

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*Robinwood Neighborhood Association Meeting*

July 11, 2023



# — Agenda

- Introductions
- Calaroga Pump Station Overview
  - » Background and Need for Project
  - » Description of Project
  - » Maintenance and Operations
  - » Construction Schedule
- Open Discussion and Q&A

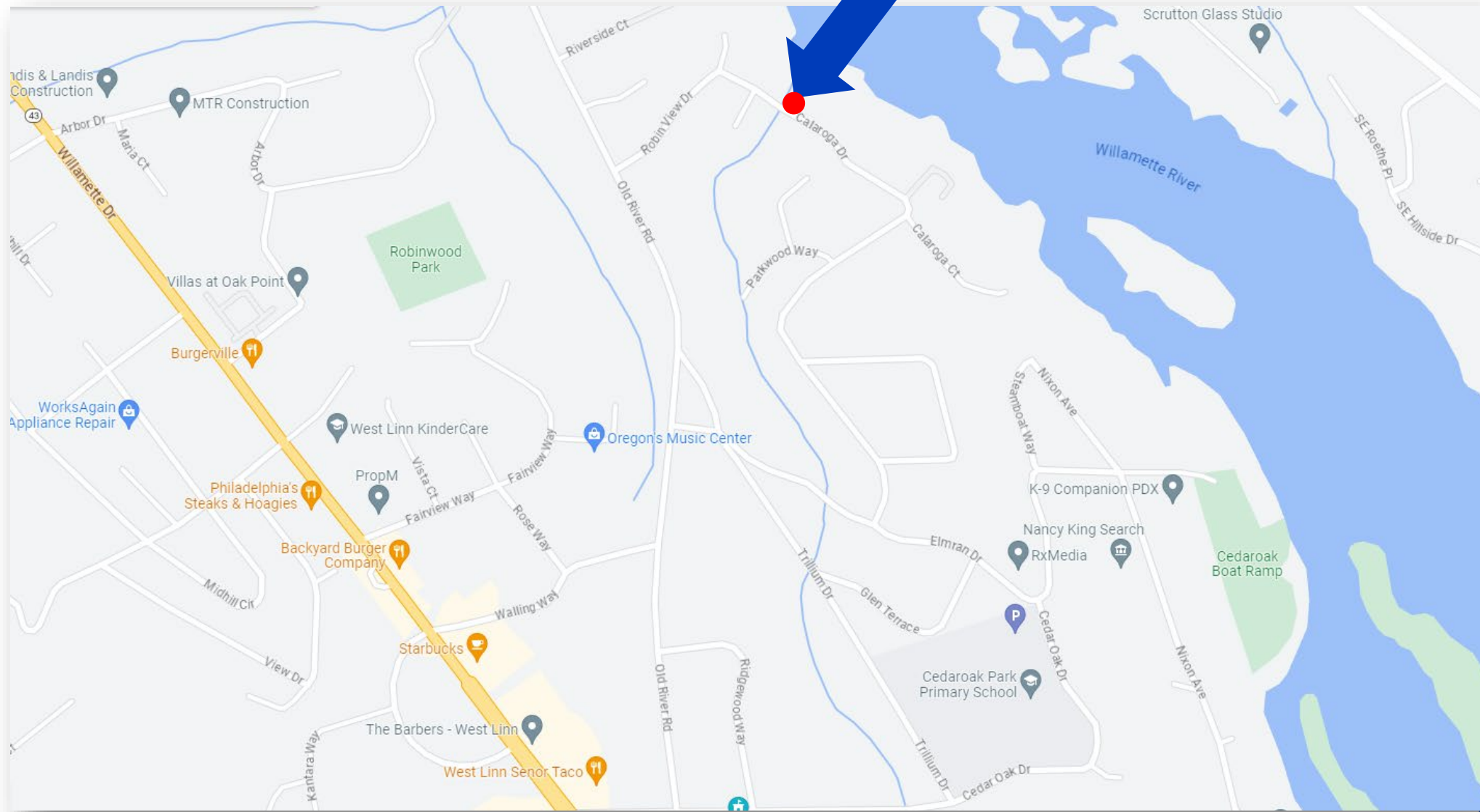


# — Introductions

- City of West Linn
  - » Maryna Asuncion – Project Manager
  - » Luke Borland – Community Relations
- Engineering Design Consultants
  - » Corianne Burnett with Carollo Engineers, Project Manager
  - » Susanna Julber with Consor, Land Use Lead for Project

# Calaroga Pump Station

# Pump Station Location



# Project Background and Need

- Pump Station collects gravity sewer from surrounding homes and neighborhood
- Pump Station pumps it south on Calaroga Drive and discharges into a gravity sewer
- Current location is below the 100-year flood elevation
- Cannot pump adequately during flooding
- Project will replace aging equipment to ensure continuous operations



# Location Selected Based on Best Alternative

Preferred  
Alternative



- Alternatives analysis completed in October 2022
  - » Installing a new wet well above 100-year flood elevation
- Benefits:
  - » Raises all mechanical, electrical, and control infrastructure and away from flooding
  - » Allows access to the wet well from the paved roadway

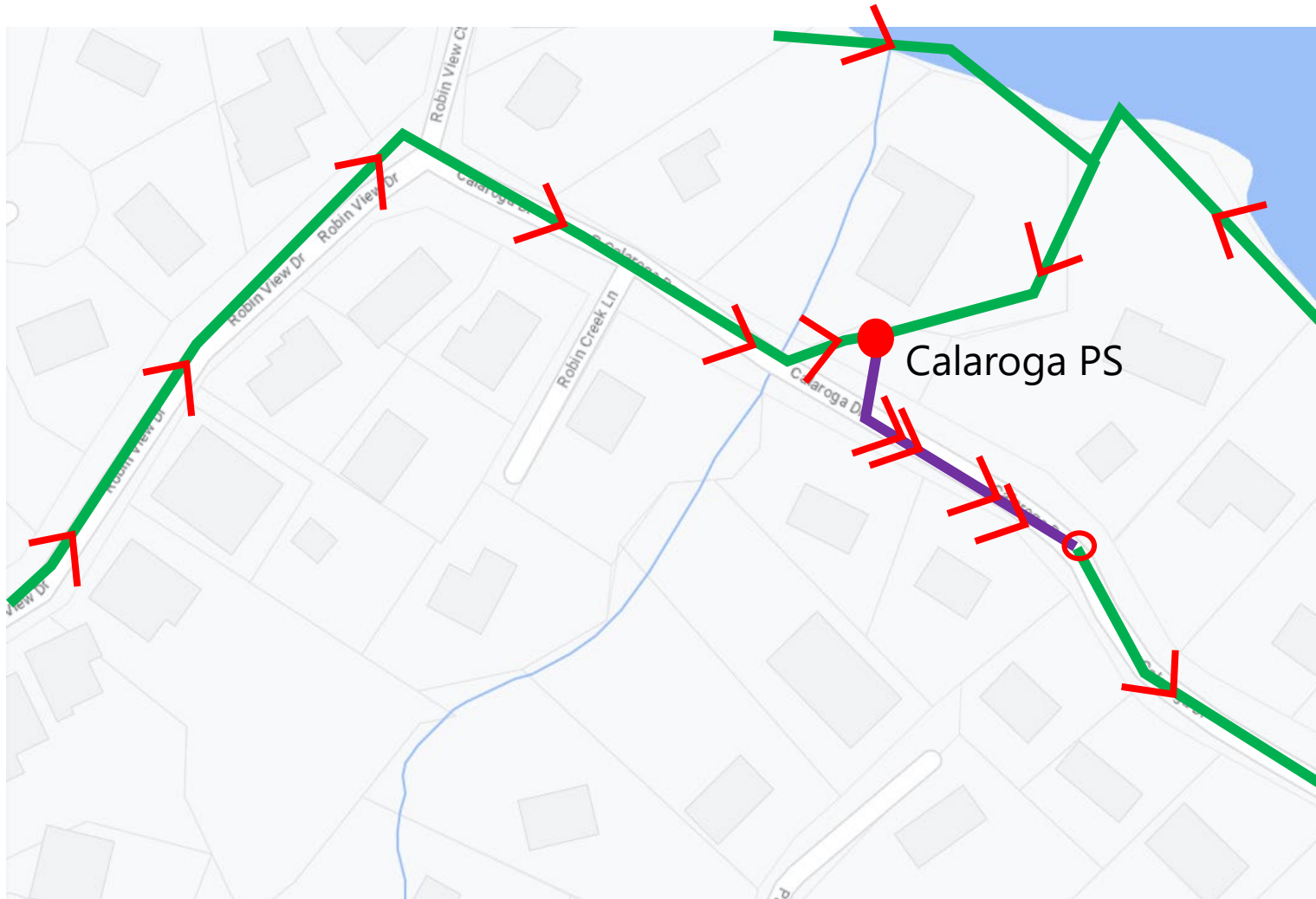


# Project Goals

- Relocate the pump station farther away from the boundaries of Trillium Creek
- Provide safe access to the pump station during a 100-year flood event
- Provide an area for safe parking for City maintenance workers
- Increase Pump Station capacity

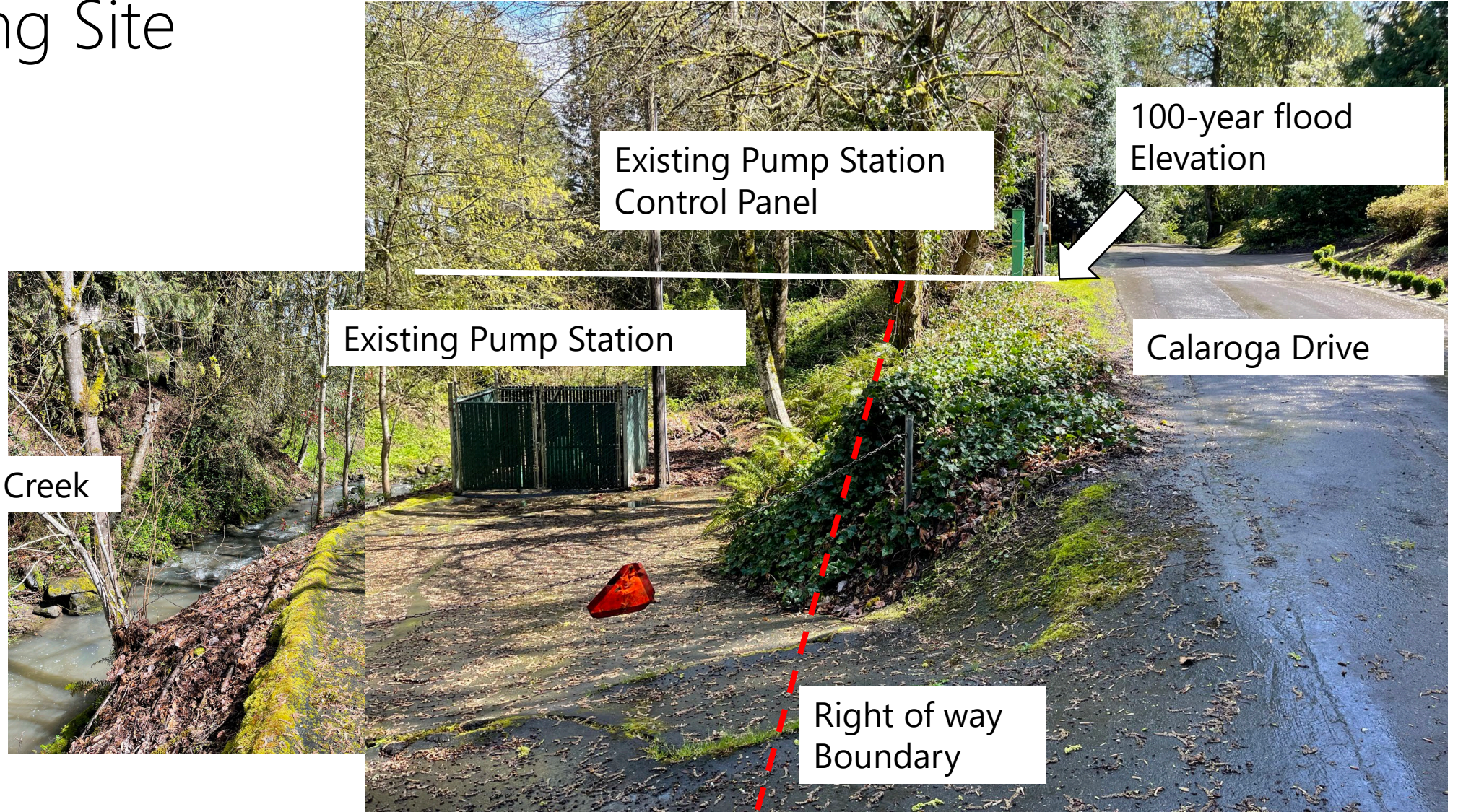


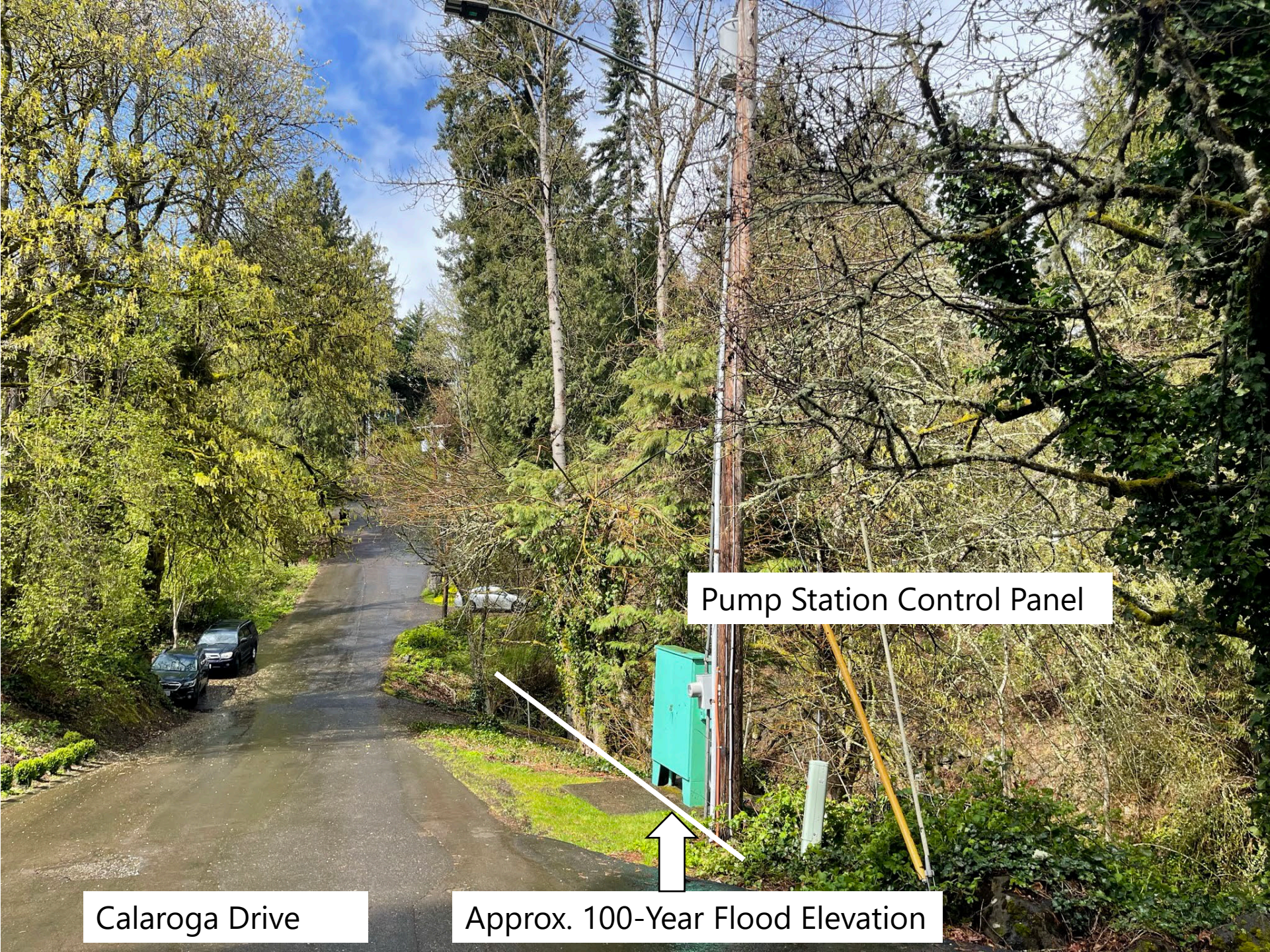
# Pump Station collects sewer from neighborhood



1. Gravity sewers collect sewer from houses.
2. Pumps sewer up hill and discharges into a manhole.
3. Sewer continues through the West Linn Sewer Collection System to the Wastewater Treatment Plant

# Existing Site





Pump Station Control Panel

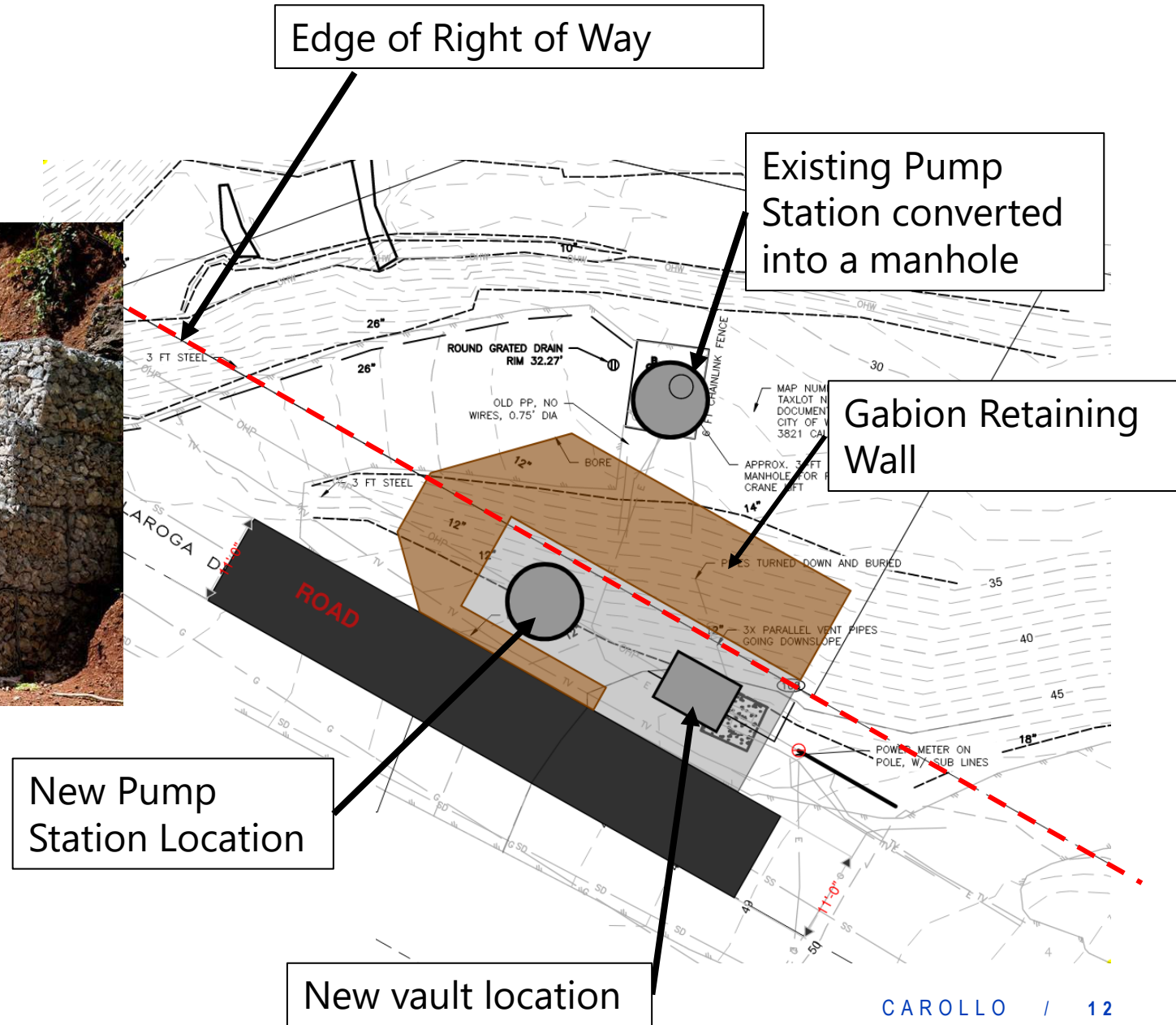
Calaroga Drive

Approx. 100-Year Flood Elevation

# Project Description

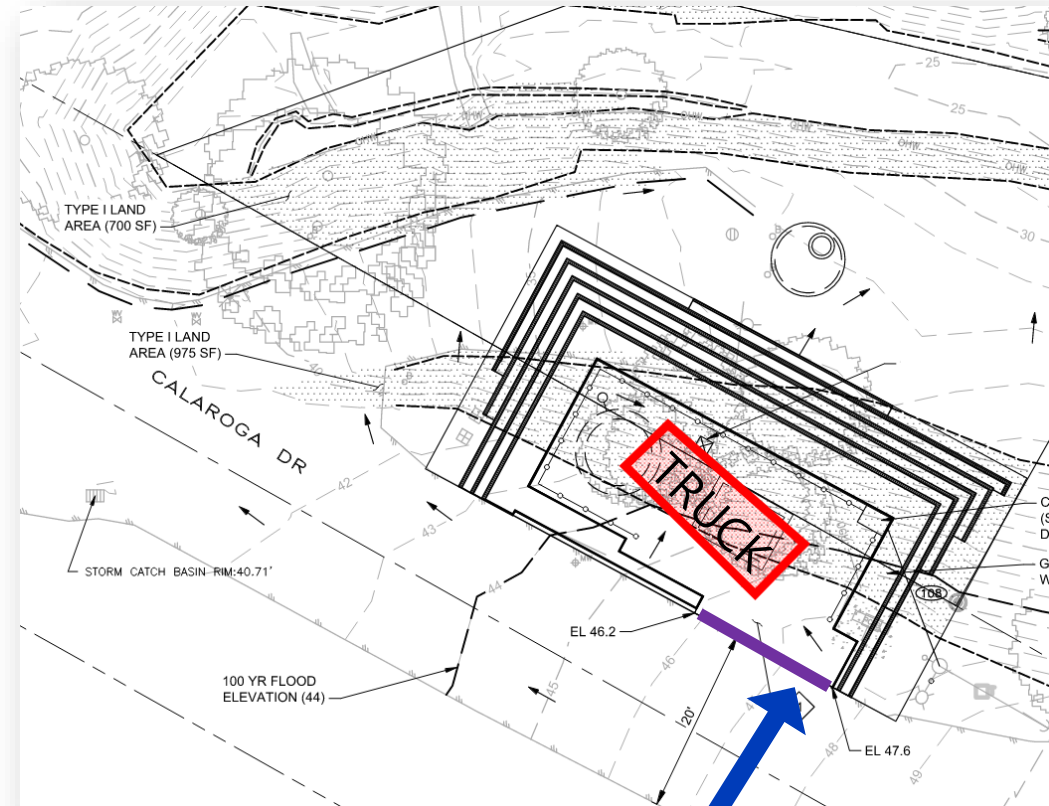


Examples of Rock Gabion Walls



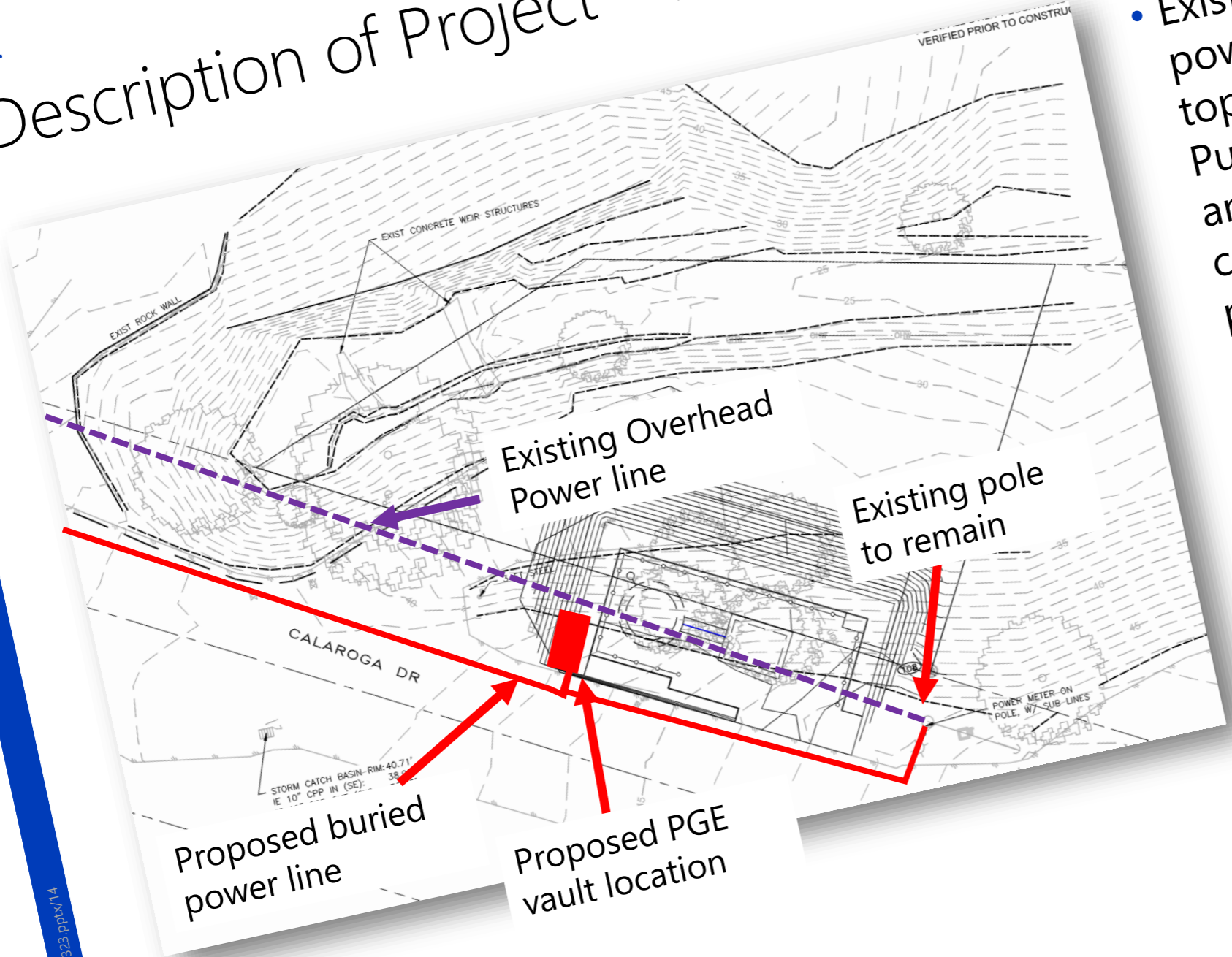
# Site Access for Operations and Maintenance

- When visiting site for routine maintenance of the pump station, City staff will park off the of paved road.
- Pump station will have the same number of visits by City Staff as the existing pump station.
- City Staff will visit the site approximately once a week to perform routine maintenance



Locked Gate/Chain

# Description of Project – Power Relocation



- Existing overhead powerline is directly over top of new pump station. Pumps will be removed and maintained using a crane. The location of the power lines is a safety hazard.
- Coordination with PGE and to match existing neighborhood, powerline will be buried to serve new pump station

# Resource Areas – Creeks, Wetlands, Floodplains

- Trillium Creek (no work proposed in creek, light blue)
- No wetlands on pump station property
- City Riparian Buffer (100 ft from stream, light green) covers entire property and will be impacted (0.03 ac)
- On-site mitigation/reveg (0.02 ac)
- Off-site mitigation will be needed, location TBD.



LEGEND	
	Existing Developed Area in Buffer (0.02 acres)
	Existing Developed Buffer to be Redeveloped (0.01 acres)
	Proposed Permanent Buffer Impact (0.03 acres)
	Proposed Replanting / Vegetated Enhancement Area (0.02 acres)

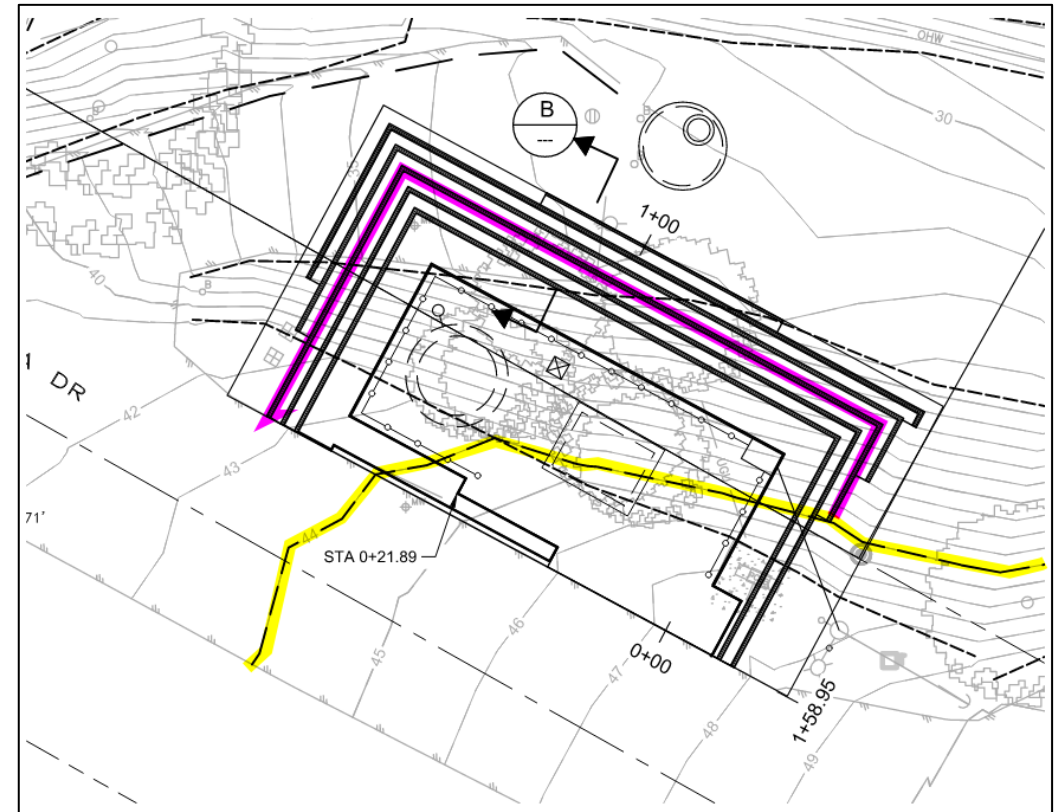
## Proposed Replanting

- Red alder
- Bigleaf maple
- Red cedar
- Red elderberry
- Vine maple
- Snowberry
- Sword fern



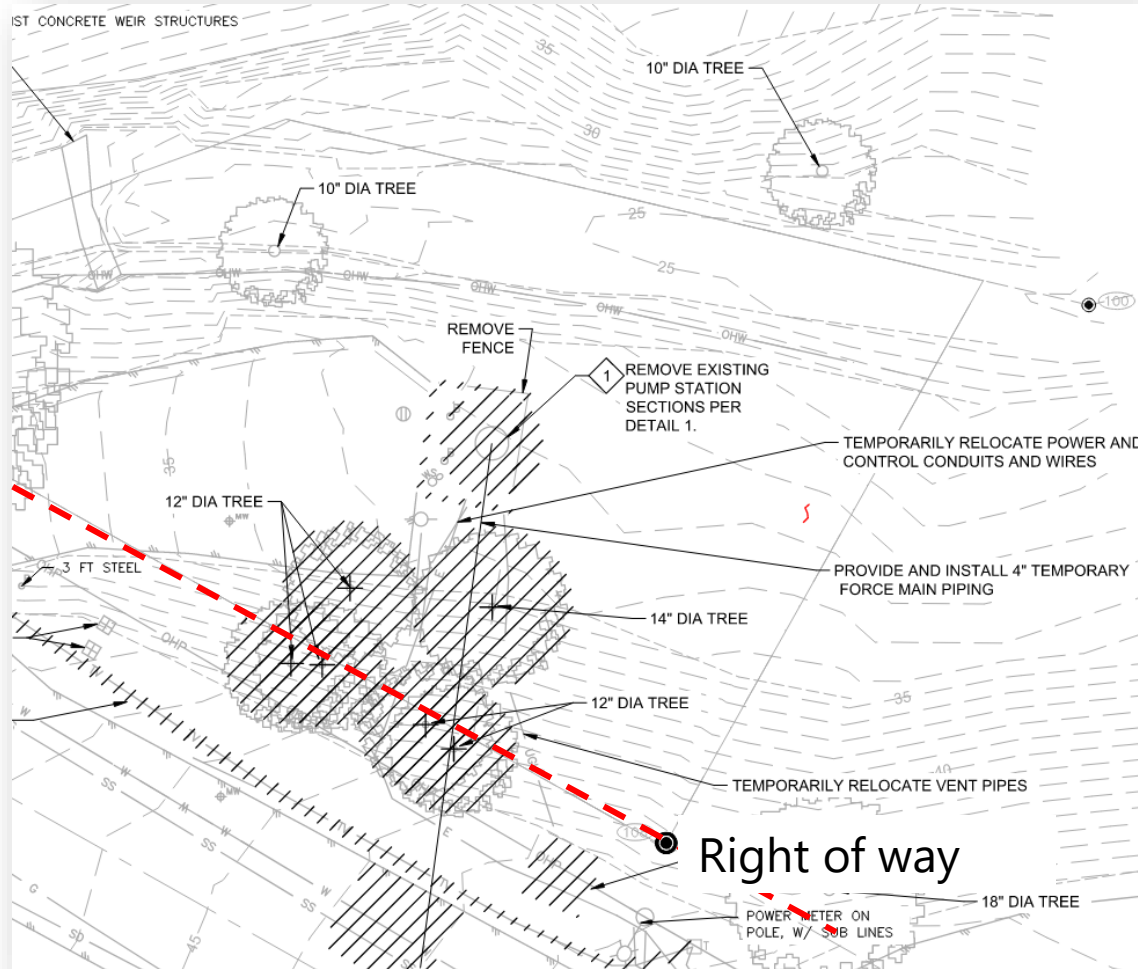
# Floodplain Development Requirements

- City Standards:
  - » Keep flood waters out of pump station
  - » Keep sewage out of flood waters
  - » No change to flood elevation
- Proposed design will:
  - ✓ Grade site to provide buildable area above flood elevation
  - ✓ Not increase flood elevation, based on initial analysis
    - Currently fine-tuning analysis to confirm “no rise”



Flood elevation = 44 feet above sea level  
Existing 44-foot elevation  
Proposed 44-foot elevation

# Description of Project – Tree Removal



 Trees proposed for removal (6)

# Schedule

- Design and Permitting Schedule
  - » July 2023 Land Use Submittal to West Linn Planning
  - » Sept 2023 Design Complete
  - » Sept/Oct 2023 Planning Commission Hearing (TBD)
  - » Dec 2023 Obtain Permit Approvals
  - » Dec 2023 Bid Project to Contractors
- Construction Schedule
  - » March 2024 Construction starts at Pump Station Site
  - » Oct 2024 Construction Complete

# Discussion Question and Answer

# Thank you

Contact Susanna Julber for any follow up questions at  
[Susanna.Julber@consoreng.com](mailto:Susanna.Julber@consoreng.com) or at 541-419-4009

# Appendix E

Hydraulic Analysis and No-Rise Certification



# Hydraulic Report

## West Linn Calaroga Sanitary Sewer Pump Station Replacement

Ref #CARO-0000-4021

July 2023



**West Linn Calaroga Sanitary Sewer  
Pump Station Replacement  
City of West Linn, Oregon**

**Hydraulic Report**

Prepared for  
**Carollo**

Prepared By  
**Megan Stites**

Reviewed By  
**Atalia Raskin, P.E.**

**David Evans and Associates, Inc.**

2100 S River Parkway, Suite 100  
Portland, OR 97201

DEA Project Number: CARO00004021

July 2023



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## 1 SUMMARY

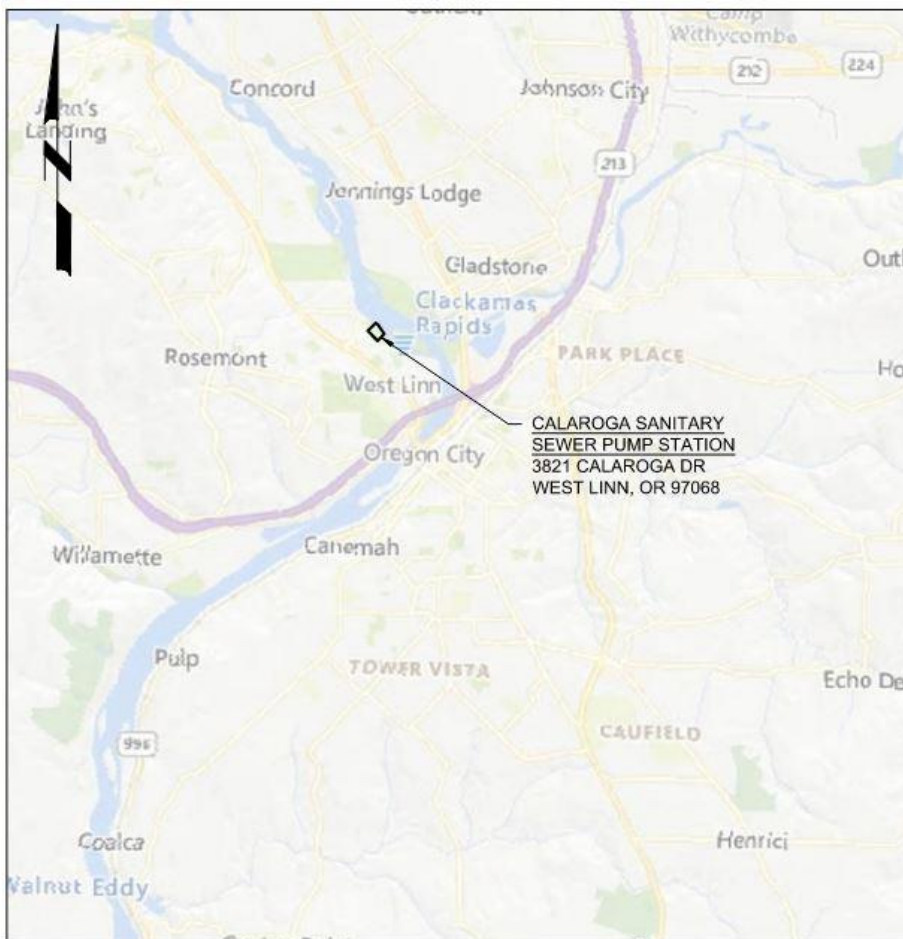
The West Linn Calaroga Sanitary Sewer Pump Station Replacement Project (Project) includes constructing a replacement sanitary sewer pump station, located at 3831 S. Calaroga Drive, West Linn, Oregon (see Figure 1-1 – Vicinity Map).

This Hydraulic Report (Report) was prepared to document the effects of the Project on the Federal Emergency Management Agency (FEMA) floodplain. This site is located inside the boundary of a Special Flood Hazard Area (SFHA) with a zone 'AE' designation (see Appendix B: FIRM Panel 41005C0019D) effective on June 17, 2008, of the Willamette River. The AE designation indicates this area is within the regulatory floodplain, with an associated base flood elevation (BFE). Therefore, the project must comply with West Linn's Community Development Code Chapter 27 – Flood Management Areas.

Hydraulic Engineering Center – River Analysis System (HEC-RAS) was used to complete the hydraulic analysis. An existing HEC2 model of the Willamette River was used as a basis for this analysis. LiDAR data was used to supplement the HEC2 data at the project location.

Model results determined that the project would result in no-rise to the water surface elevation of the Willamette River during the BFE (100-year flow event).

Figure 1-1 – Vicinity Map



## **2 INTRODUCTION**

This Project includes constructing a proposed sanitary sewer pump station accessible from Calaroga Drive. The pump station will be supported by a gabion wall. Project plans are included in Appendix A.

### **2.1 METHODOLOGY**

The purpose of this report is to describe the methods and parameters used to complete the hydraulic analysis. Since the site is located within the Willamette River floodplain, the analysis follows the standards of City of West Linn Community Development Code Chapter 27 – Flood Management Areas and FEMA requirements.

The proposed sanitary sewer pump station will add fill to the Willamette River floodplain. A HEC-RAS model was developed for the Willamette River to determine if the proposed improvements result in a change to the BFE. The pump station is located next to Trillium Creek, a stream collecting runoff from the neighborhood around the pump station. Since Trillium Creek isn't the source of flooding, it was not included in the hydraulic model analysis. See Appendix B for the inputs used to create the model. Water surface elevation during the BFE (100-year flood event) was compared between the corrected effective and proposed model (See Section 5.3 Results and Appendix C).

Elevations referenced within this report and hydraulic analysis are based on the NAVD 88 vertical datum.

### **2.2 PREVIOUS STUDIES**

An existing hydraulic model of the Willamette River was developed using HEC2 in 1987. The existing model results were obtained as a pdf printout and were used to develop the HEC-RAS hydraulic model for this project. No other studies were located for this Project area. See Appendix B for the printout of inputs used to develop the model.

## **3 EXISTING SITE CONDITIONS**

### **3.1 LAND-USE**

The project site contains an existing access driveway and fenced in pump station bordered by trees and thick shrubs next to Trillium Creek and is surrounded by low-density single-family residential developments. This section of the Willamette River flows through the residential communities of West Linn and Oak Grove, Oregon.

### **3.2 CHANNEL OBSERVATIONS**

DEA performed a desktop evaluation reviewing publicly available information of the Willamette River. It was observed that the Willamette River adjacent to the project location consists of grassy overbanks with forested areas next to single-family homes. The river does not show evidence of lateral channel migration and is relatively straight. Debris was not observed in the river channel. Project site photos were used to observe the overbank conditions.

### **3.3 MANNING'S 'n'**

Manning's 'n' (roughness coefficient) values estimate friction loss through a river system. Values were selected following the existing HEC2 model. The HEC2 model listed the Manning's 'n' value for overbank

and channel were 0.07 – 0.1 and 0.032 – 0.07, respectively. The values were verified by project site photos and aerial imagery to accurately represent condition in the project area.

## 4 HYDROLOGY

Flows from FEMA’s HEC2 model of the Willamette River were used for this analysis and are consistent with the FIS study, 41005CV001B (see Appendix B: HEC2 Existing Model & FIS Study Table 5 Summary of Discharges).

Table 4-1 lists the 10-, 50-, 100- and 500-year peak discharges. The quantity of flow remains constant throughout the Project study area.

Table 4-1 – Peak Discharge for the Willamette River

Recurrence Interval (Years)	Willamette River HEC2 Model (cu.-ft./sec)
10	251,000
50	329,000
100	375,000
500	495,000

## 5 HYDRAULIC ANALYSIS

The United States Army Corps of Engineer’s HEC-RAS (version 6.3.1) software was used to model the channel study area. Three hydraulic model conditions were developed to compare the hydraulic effects of the proposed fill at the project site.

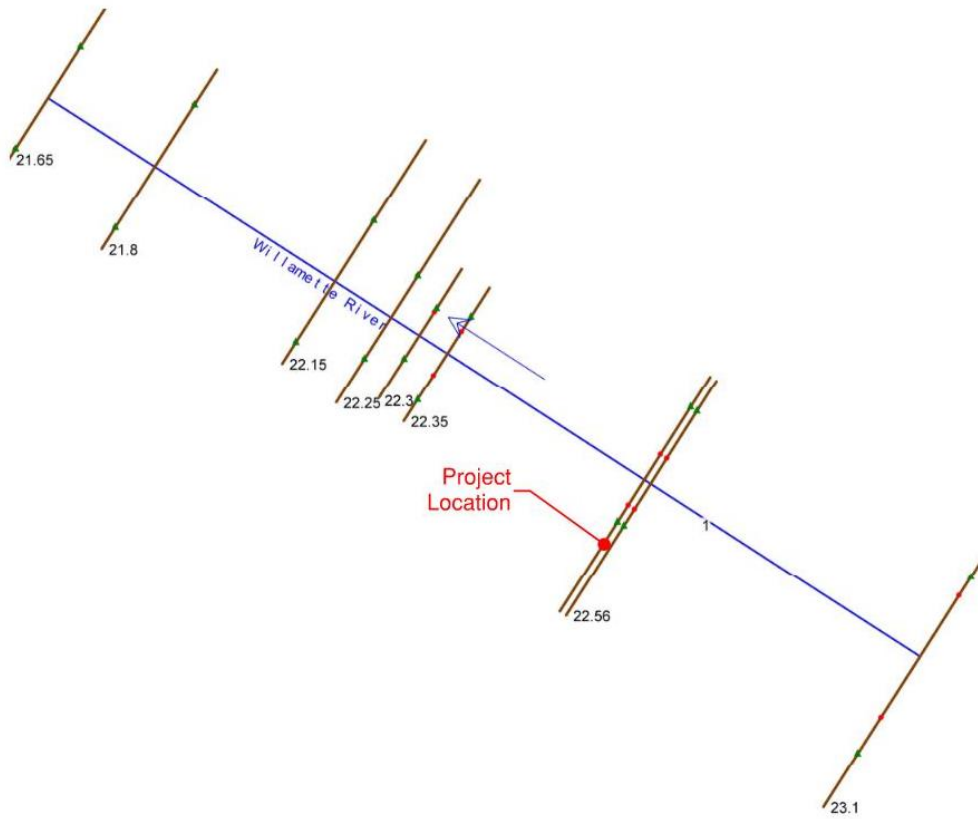
- Duplicate conditions model
- Corrected effective model
- Proposed conditions model

The duplicate model only includes data from the existing HEC2 model and recreates the effective model used to develop the FIS and mapping. The corrected effective and proposed model include cross-sections at the project location with data from LiDAR and an interpolated river bottom elevation based on the bounding HEC2 cross-sections upstream and downstream of the site. Survey data was used as a reference to confirm that the LiDAR was sufficient to represent the cross-sectional data at the project site. The proposed conditions model adds the new grading of the proposed pump station.

### 5.1 CHANNEL GEOMETRY

The hydraulic models were built using a series of topography sources. The Duplicate conditions model only used the HEC2 data to define cross sections. The Corrected effective model used the following sources to define cross sections: 1) Existing model HEC2 Data and 2) LiDAR Data (DOGAMI). The Proposed conditions model used the following sources to define cross sections: 1) Proposed grading, 2) Existing model HEC2 Data, and 3) LiDAR Data (DOGAMI). Figure 5-1 shows the cross sections in the Project vicinity.

Figure 5-1 – HEC-RAS Cross Section Map



## 5.2 BOUNDARY CONDITIONS

Simulated water surface elevations were determined using a steady-state simulation. The downstream boundary condition was assigned using a known water surface elevation from the FEMA Willamette River flood profile, 41005CV003B (see Appendix B).

## 5.3 RESULTS

Table 5-1 list the 100-year water surface elevation through the Project improvements. The table compares the water surface elevation between the Duplicate conditions, Corrected effective model, and Proposed model. The difference in water surface elevation is calculated between the corrected effective model and the proposed model. As indicated in the table below, the water surface elevation does not increase along the Project site (see Appendix C for HEC-RAS Results).

Table 5-1 – 100-Year Hydraulic Results Comparison

Cross Section	Duplicate Conditions Water Surface Elevation (ft)	Corrected Effective Surface Elevation (ft)	Proposed Water Surface Elevation (ft)	Difference in Water Surface Elevation Between Corrected Effective and Proposed Model (ft)
21.65	41.93	41.93	41.93	0
21.80	42.82	42.82	42.82	0
22.15	43.51	43.51	43.51	0
22.25	43.40	43.40	43.40	0
22.30	43.50	43.50	43.50	0
22.35	43.58	43.58	43.58	0
22.55 (project site)	-	43.73	43.73	0
22.56 (project site)	-	43.74	43.74	0
23.10	44.59	44.65	44.65	0

## 6 CONCLUSION

This Hydraulic Report summarizes the hydraulic analysis completed on the Willamette River. The model compares the proposed site conditions of a new sanitary sewer pump station supported by a gabion wall to existing conditions. The volume of fill of the new construction is negligible relative to the overall flow volume of the Willamette River (see Appendix C: HEC-RAS Project Location Cross-Section). Results of HEC-RAS modeling indicate that the water surface elevation will not rise as a result of this project.

## **REFERENCES**

City of West Linn Community Development Code Chapter 27 – Flood Management Areas, 2022.

Federal Emergency Management Agency (FEMA) State Mitigation Planning Policy, 2023

Oregon Department of Transportation (ODOT), Hydraulics Manual, Parts 1 & 2, 2014.

**APPENDICES**



## Appendix A:

- West Linn Calaroga Sanitary Sewer Pump Station Replacement 30% Plans

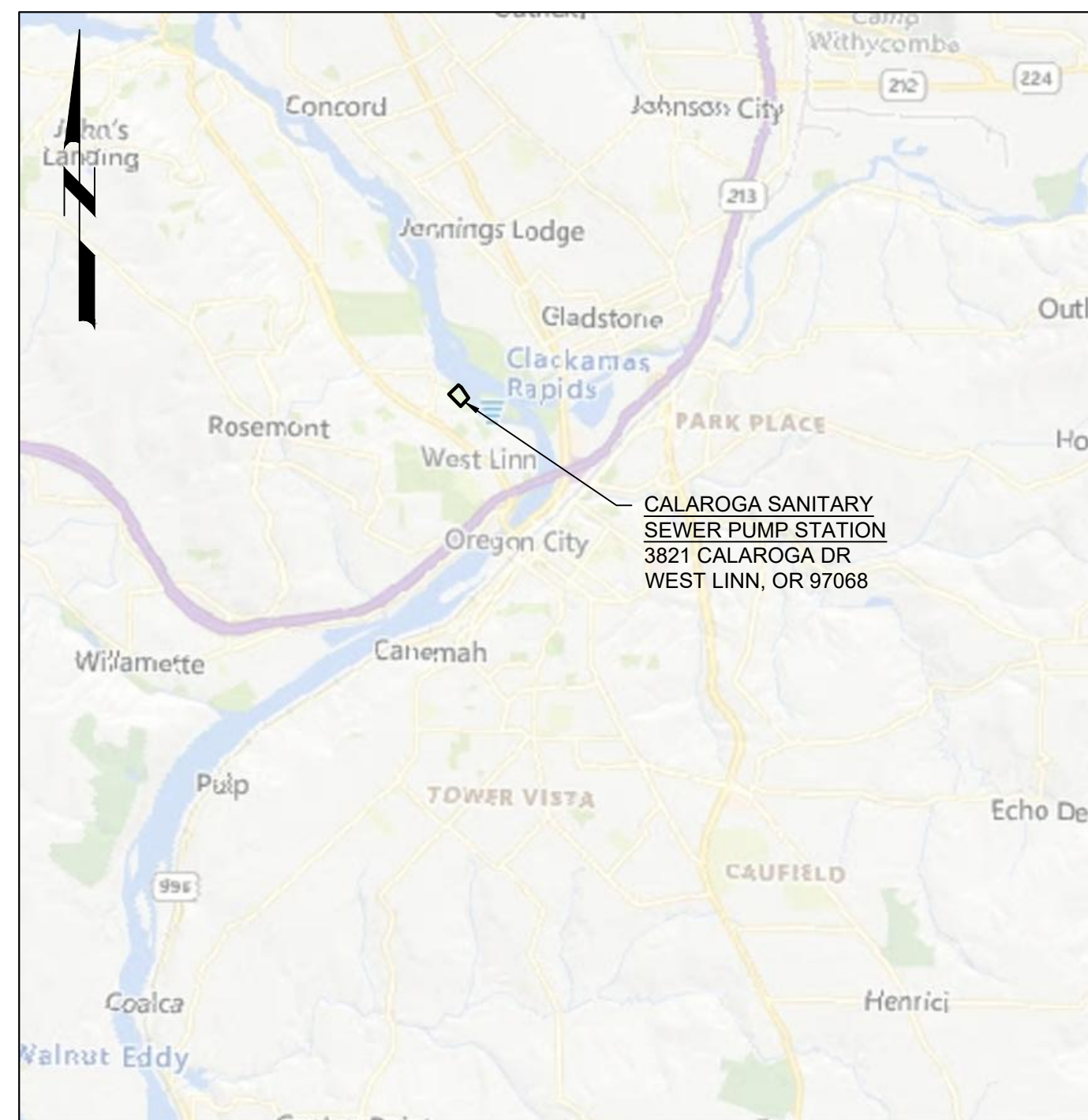
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# CITY OF WEST LINN

# CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT

## PROJECT PW-22-05

VOLUME # OF #  
APRIL 2023



VICINITY MAP



LOCATION MAP



707 SW WASHINGTON STREET  
SUITE 500  
PORTLAND, OREGON 97205  
PHONE: 503-227-1885 FAX: 503-227-1747



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
GENERAL

COVER SHEET

VERIFY SCALES  
JOB NO. 201779  
DRAWING NO. G01  
SHEET NO. X OF XX

<b>30% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED CE			
DRAWN CE			
CHECKED CE			
DATE APRIL 2023			
REV	DATE	BY	DESCRIPTION

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Plot Date: 10/5/2022 11:09:47 AM

LAST SAVED BY: sraustad

1 2 3 4 5 6 7 8 9 10 11 12 13

### DRAWING INDEX

### DESIGN CRITERIA

SHT NO.	DWG NO.	DESCRIPTION
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(G) - GENERAL

1	G01	COVER SHEET
2	G02	DRAWING INDEX AND DESIGN CRITERIA
3	G03	NOTES AND ABBREVIATION
4	G04	GENERAL AND CIVIL LEGEND AND ABBREVIATIONS
X 5	G05	GENERAL STRUCTURAL NOTES AND LEGEND
6	G06	SITE PLAN

(D) - DEMOLITION

7	D01	SITE PLAN
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(C) - CIVIL

X 8	C01	GRADING PLAN
9	C02	DEWATERING, SHORING, AND EXCAVATION PLAN
10	C03	YARD PIPING PLAN
11	C04	PUMP STATION, VALVE VAULT, AND EXISTING WET WELL PLAN AND SECTIONS
X 12	C05	DETAILS
X 13	C06	DETAILS
14	ESC01	EROSION AND SEDIMENT CONTROL COVER SHEET
15	ESC02	EROSION AND SEDIMENT CONTROL SITE PLAN
16	ESC03	EROSION AND SEDIMENT CONTROL DETAILS

(S) - STRUCTURAL

X 17	S01	RETAINING WALL PLAN AND SECTIONS
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(E) - ELECTRICAL

18	E01	ELECTRICAL DRAWING INDEX, ABBREVIATIONS & SYMBOLS
X 19	E02	ELECTRICAL SITE PLAN
20	E03	ONE-LINE DIAGRAM
X 21	E04	CONDUIT RUN & GROUNDING
X 22	E05	CONTROL PANEL LAYOUT
X 23	E06	TYPICAL DETAIL
24	E07	CONDUCTOR / CONDUIT SCHEDULE

(N) - INSTRUMENTATION

25	N01	PROCESS & INSTRUMENTATION DRAWING INDEX, LEGEND & SYMBOLS
X 26	N02	'
X 27	N03	'
X 28	N04	'
X 29	N05	'
30	N06	WET WELL PROCESS & INSTRUMENTATION DIAGRAM
31	N07	VALVE VAULT PROCESS & INSTRUMENTATION DIAGRAM

X = SHEETS NOT INCLUDED FOR 30% SUBMITTAL

**30% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

DESIGNED	CE
DRAWN	CE
CHECKED	CE
DATE	APRIL 2023



CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 GENERAL

VERIFY SCALES  
 BAR IS ONE INCH ON ORIGINAL DRAWING  
 0 1"  
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
 DRAWING NO. G02  
 SHEET NO. X OF XX

DRAWING INDEX AND DESIGN CRITERIA

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# ABBREVIATIONS

# NOTES

<b>A</b>	△ DELTA, DEFLECTION ANGLE, OR CENTRAL ANGLE # NUMBER (REBAR Ø) @ AT (MEASUREMENT) +/- PLUS/MINUS	<b>F</b>	FC FLEXIBLE COUPLING FCA FLANGE COUPLING ADAPTER FF FINISHED FLOOR FG FINISHED GRADE FH FIRE HYDRANT FIN FINISH FL FLOOR, FLOW LINE FLEX FLEXIBLE FLG FLANGE(D) FM FORCE MAIN FND FOUNDATION FO FIBER OPTIC FOB FLAT ON BOTTOM FOC FACE OF CURB FOT FLAT ON TOP FPM FEET PER MINUTE FS FIRE SERVICES FSP FABRICATED STEEL PIPE FT or ' FOOT, FEET FTG FOOTING	<b>PROP</b>	PROPERTY PL PROPERTY LINE PSI POUNDS PER SQUARE INCH PT POINT, POINT OF TANGENCY PV PLUG VALVE PVC POINT OF VERTICAL CURVATURE PVC POLYVINYL CHLORIDE PVI POINT OF VERTICAL INTERSECTION PVM PAVEMENT PVT POINT OF VERTICAL TANGENCY
<b>B</b>	ABC AGGREGATE BASE COURSE ABND ABANDONED AC ASPHALTIC CONCRETE ACI AMERICAN CONCRETE INSTITUTE ACP ASBESTOS CEMENT PIPE ADDL ADDITIONAL ADJ ADJACENT, ADJUST(ABLE) AL ALUMINUM APPROX APPROXIMATE(LY) ARV AIR RELEASE VALVE ASSY ASSEMBLY ASTM AMERICAN SOCIETY FOR TESTING AND MATERIALS AVG AVERAGE AVV AIR AND VACUUM VALVE	<b>G</b>	G GAS, GUTTER GA GAUGE GAL GALLONS GALV GALVANIZE(D) GB GRADE BREAK GC GROOVED COUPLING GEN GENERAL, GENERATOR GM GAS METER GND GROUND GPD GALLONS PER DAY GPM GALLONS PER MINUTE GR GRADE GRG GRATING GRTS GALVANIZED STEEL PIPE GV GATE VALVE	<b>RQ</b>	R RADIUS RAD RADIAL RCB REINFORCED CONCRETE BOX CULVERT RCP REINFORCED CONCRETE PIPE RED REDUCER REF REFERENCE REINF REINFORCE(D)(ING)(MENT) REQ'D REQUIRED REV REVISION RFCA RESTRAINED FLEX COUPLING ADAPTER RH RIGHT HAND ROW RIGHT OF WAY RR RAILROAD RT RIGHT
<b>C</b>	BC BEGIN CURB BF BLIND FLANGE BFP BACK FLOW PREVENTER BFV BUTTERFLY VALVE BH BOREHOLE BLDG BUILDING BM BENCH MARK BO BLOW OFF BOC BACK OF CURB BOP BOTTOM OF PIPE BOT BOTTOM BV BALL VALVE BVC BEGINNING OF VERTICAL CURVE BYP BYPASS	<b>H</b>	HDPPE HIGH DENSITY POLYETHYLENE HORIZ HORIZONTAL HP HIGH POINT HPGM HIGH PRESSURE GAS MAIN HW HEADWALL, HOT WATER HWL HIGH WATER LEVEL HWY HIGHWAY HYD HYDRANT	<b>S</b>	S SLOPE, SOUTH SCH SCHEDULE SDF STORM DRAIN SDDI STORM DRAIN DROP INLET SDMH STORM DRAIN MANHOLE SE SOUTHEAST SECT SECTION SHLD SHOULDER SHT SHEET SIM SIMILAR SL SLOPE SPEC(S) SPECIFICATION(S) SQ SQUARE SS SANITARY SEWER SSCO SANITARY SEWER CLEANOUT SSMH SANITARY SEWER MANHOLE SST STAINLESS STEEL ST STREET STA STATION STD(S) STANDARD(S) STL STEEL STRUCT STRUCTURAL SW SOUTHWEST SWK SIDEWALK SYM SYMMETRICAL
<b>D</b>	CATV CABLE TV CAV COMBINATION AIR VALVE CB CATCH BASIN CC CENTER OF CURVATURE, CENTER TO CENTER, CONCRETE CURB CDT CONDUIT CF CUBIC FEET CFM CUBIC FOOT PER MINUTE CFPS CUBIC FEET PER SECOND CI CAST IRON CIP CAST IRON PIPE CIPP CURED IN PLACE PIPE CJ CONSTRUCTION JOINT CL CENTER LINE CLK CHAIN LINK CLR CLEAR / CLEARANCE CLSM CONTROL LOW STRENGTH MATERIAL CMLC CEMENT MORTAR LINED AND COATED CMP CORRUGATED METAL PIPE CMU CONCRETE MASONRY UNIT CO CLEANOUT CONC CONCRETE CONN CONNECT, CONNECTION CONST CONSTRUCTION CONT CONTINUOUS OR CONTINUATION OR (D) COORD COORDINATE CP CONTROL POINT CPLG COUPLING CSP CORRUGATED STEEL PIPE CTJ CONTROL JOINT CTL CONTROL CTR CENTER, CENTERED CU CUBIC CULV CULVERT CY CUBIC YARD	<b>I</b>	ID INSIDE DIAMETER IE INVERT ELEVATION IN or " INCHES INCL INCLUDE, INCLUDING INSTR INSTRUMENTATION INV INVERT IP IRON PIPE IRR IRRIGATION	<b>T</b>	TB THRUST BLOCK TC TOP OF CURB TEL TELEPHONE TOG TOP OF GRATING TMH TELEPHONE MANHOLE TOC TOP OF CONCRETE TOP TOP OF PIPE TOW or TW TOP OF WALL TRD TREAD TYP TYPICAL
<b>E</b>	CAV COMBINATION AIR VALVE CB CATCH BASIN CC CENTER OF CURVATURE, CENTER TO CENTER, CONCRETE CURB CDT CONDUIT CF CUBIC FEET CFM CUBIC FOOT PER MINUTE CFPS CUBIC FEET PER SECOND CI CAST IRON CIP CAST IRON PIPE CIPP CURED IN PLACE PIPE CJ CONSTRUCTION JOINT CL CENTER LINE CLK CHAIN LINK CLR CLEAR / CLEARANCE CLSM CONTROL LOW STRENGTH MATERIAL CMLC CEMENT MORTAR LINED AND COATED CMP CORRUGATED METAL PIPE CMU CONCRETE MASONRY UNIT CO CLEANOUT CONC CONCRETE CONN CONNECT, CONNECTION CONST CONSTRUCTION CONT CONTINUOUS OR CONTINUATION OR (D) COORD COORDINATE CP CONTROL POINT CPLG COUPLING CSP CORRUGATED STEEL PIPE CTJ CONTROL JOINT CTL CONTROL CTR CENTER, CENTERED CU CUBIC CULV CULVERT CY CUBIC YARD	<b>J</b>	JT JOINT	<b>U</b>	UC UNDERCUT UG UNDERGROUND UGE UNDERGROUND ELECTRIC UNKN UNKNOWN UNO UNLESS NOTED OTHERWISE USA UNDERGROUND SERVICE ALERT
<b>F</b>	DRAIN, DEPTH D/W DRIVEWAY APRON DEG or ° DEGREE DEMO DEMOLISH, DEMOLITION DET DETAIL DI DROP INLET DIA or Ø DIAMETER DIFF DIFFERENCE DIM DIMENSION DIP DUCTILE IRON PIPE DIST DISTANCE DR DRIVE, DRAIN DWG(S) DRAWING(S)	<b>L</b>	L LENGTH LAT LATERAL LATITUDE LATITUDE LB(S) POUND(S) LF LINEAL FEET LH LEFT HAND LONG LONGITUDINAL LP LOW POINT LT LEFT LWL LOW WATER LEVEL	<b>V</b>	V VERTICAL, VALVE VAR VARIES VB VALVE BOX VC VERTICAL CURVE, VICTAULIC COUPLER VITRIFIED CLAY PIPE VERT VERTICAL VLT VAULT VPI VERTICAL POINT OF INTERSECTION
<b>G</b>	E ELECTRICAL, EAST EA EACH ECC END OF CURB ECC ECCENTRIC REDUCER EG EXISTING GROUND EL ELEVATION ELL ELBOW ELEC ELECTRICAL EMH ELECTRICAL MANHOLE EOP END OF PIPE EP EDGE OF PAVEMENT EQ EQUAL EQUIP EQUIPMENT ES EACH SIDE ESMT EASEMENT EVC END OF VERTICAL CURVE EW EACH WAY EXIST EXISTING EXP EXPANSION EXT EXTERIOR	<b>M</b>	MATL MATERIAL MAX MAXIMUM MECH MECHANICAL MFR MANUFACTURER MGD MILLION GALLONS PER DAY MH MANHOLE MIN MINIMUM MISC MISCELLANEOUS MJ MECHANICAL JOINT MON MONUMENT	<b>W</b>	W WATER, WIDTH OR WEST W WITH W/O WITHOUT WL WATER LEVEL WM WATER METER WS WATER SURFACE WSP WELDED STEEL PIPE WSTP WATERSTOP WV WATER CONTROL VALVE WW WASTEWATER
		<b>N</b>	N NORTH, NORTHING NA NOT APPLICABLE NE NORTHEAST NG NATURAL GAS NIC NOT IN CONTRACT NO OR # NUMBER NOM NOMINAL NW NORTHWEST	<b>X</b>	XFMR TRANSFORMER
		<b>O</b>	O.F. OUTSIDE FACE OC ON CENTER OD OUTSIDE DIAMETER, OUTSIDE DIMENSION OHE OVERHEAD ELECTRIC	<b>Y</b>	YD YARD
		<b>P</b>	PB PULLBOX PC POINT OF CURVATURE PCC POINT OF COMPOUND CURVE PERP PERPENDICULAR PH POTHOLE PI POINT OF INTERSECTION PL PLATE, PROPERTY LINE POB POINT OF BEGINNING PP POWER POLE PRC POINT OF REVERSE CURVATURE		

### GENERAL NOTES:

- FOLLOWING NOTES ARE GENERAL AND APPLY TO ALL SHEETS OF THESE CONTRACT DOCUMENTS AS IF THEY WERE WRITTEN IN THEIR ENTIRETY ON EACH SHEET.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK AND SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS INCLUDING LOCATION AND DIMENSIONS OF ALL EXISTING CONSTRUCTION AND UTILITIES. CONTRACTOR SHALL NOTIFY ENGINEER IF THERE IS A CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONSTRUCTION BEFORE PROCEEDING WITH WORK.
- UNLESS DETAILED, SPECIFIED, OR OTHERWISE INDICATED ON THE DRAWINGS, CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND GENERAL NOTES. TYPICAL DETAILS SHALL APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS ON DRAWINGS.
- WHERE NO CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PART OF WORK, DETAILS SHALL BE IN THE SAME AS FOR OTHER SIMILAR WORK.
- CONTRACTOR SHALL COMPLY WITH LOCAL CONSTRUCTION STORM WATER DISCHARGE REGULATIONS AND REQUIREMENTS.
- PRIOR TO EXCAVATION FOR NEW STRUCTURES, ELECTRICAL CONDUIT, FABRICATION OF NEW PIPING AND/OR OTHER PROPOSED UTILITIES, CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING PIPING AND UTILITIES IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL TEMPORARILY RELOCATE CONFLICTING EXISTING UTILITIES AT THE IN-CONNECTION LOCATIONS AND REINSTALL THEM AS REQUIRED TO ELIMINATE THE CONFLICT AT NO ADDITIONAL COST TO THE OWNER.
- ALL PIPELINES 12" AND LARGER SHALL HAVE A MINIMUM COVER OF 36" UNLESS THE COVER DEPTH IS SPECIFICALLY INDICATED ON THE DRAWINGS. PIPE SMALLER THAN 12" SHALL HAVE A MINIMUM COVER OF 30" UNLESS NOTED OTHERWISE. PIPES SHALL BE ROUTED AS SHOWN UNLESS MINOR REVISIONS ARE NECESSARY TO MISS EXISTING PIPES, STRUCTURES, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL FITTINGS AND ADAPTERS REQUIRED TO MAKE THE ROUTING CHANGES AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR MUST ALERT ENGINEER TO ANY ROUTE CHANGES AND SEEK APPROVAL FOR MODIFICATIONS. CONTRACTOR SHALL INCLUDE COST FOR THIS IN THE BID.
- EXISTING FACILITY AND UTILITY INFORMATION SHOWN ON THE DRAWINGS WAS OBTAINED FROM AVAILABLE RECORDS OR ELECTRONIC FILES. NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR FACILITIES AND UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL LOCATIONS, SIZES, MATERIAL TYPES, AND ELEVATIONS SHOWN AROUND OR NEAR AREAS OF NEW CONSTRUCTION PRIOR TO START OF CONSTRUCTION.
- THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT FROM DAMAGE EXISTING FACILITIES AND UTILITIES SHOWN OR NOT SHOWN THAT ARE TO REMAIN IN PLACE. ALL FACILITIES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED TO THE ORIGINAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.
- CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING PIPE, EQUIPMENT, ETC. AS REQUIRED AND SHALL PROVIDE ALL FITTINGS, ADAPTERS, AND APPURTENANCES REQUIRED TO MAKE THE CONNECTIONS. PROVIDE ALL SUPPORTS REQUIRED FOR A RIGIDLY SUPPORTED COMPLETE AND WORKING SYSTEM.
- ADJUST ALL VALVE BOXES, VAULTS, PULL BOXES, AND MANHOLES TO FINISHED GRADE UNLESS OTHERWISE SHOWN OR DIRECTED. MANHOLES IN OPEN FIELDS SHALL BE SET TWELVE INCHES ABOVE FINISHED GRADE AND VAULTS SHALL BE SIX INCHES ABOVE FINISHED GRADE.
- CONTRACTOR SHALL CONTACT THE PROPER UTILITY REPRESENTATIVE FOR QUESTIONS OR COORDINATION OF CONSTRUCTION RELATED TO EXISTING UTILITIES.  
  
STATE/REGION/MUNICIPALITY SPECIFIC: 1-800-524-8818
- CONTRACTOR SHALL VERIFY THAT PIPING SHOWN TO BE ABANDONED OR AS ABANDONED PREVIOUSLY IS NO LONGER IN SERVICE. LINES IN SERVICE SHALL BE MAINTAINED UNTIL NO LONGER REQUIRED BY THE CITY.
- ALL EXISTING PIPES THAT ARE TO BE ABANDONED IN PLACE OR REMOVED MAY NOT BE SHOWN. WHERE PIPING IS TO BE ABANDONED AND MUST REMAIN IN SERVICE UNTIL COMPLETION OF OTHER PHASES OF WORK, AND IT CONFLICTS WITH NEW PIPING, TEMPORARILY RELOCATE PIPING AS REQUIRED TO MAINTAIN SERVICE BY THE CITY.
- CONTRACTOR SHALL REROUTE THE EXISTING PIPING IF REQUIRED TO MISS THE PROPOSED STRUCTURES. THE EXISTING PIPE SHALL REMAIN IN SERVICE UNTIL NEW PIPING IS READY TO BE PLACED INTO SERVICE. DOWNTIME SHALL BE A MAXIMUM OF 2 HOURS, UNLESS SPECIFIED OR SHOWN OTHERWISE.
- THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS IN THE VICINITY OF ANY OVERHEAD ELECTRIC LINES. CONTRACTOR SHALL ABIDE BY THE NATIONAL ELECTRIC CODE AND ANY REQUIREMENT BY THE OWNER OF THE ELECTRIC LINES.
- PROVIDE ALL SHEETING/SHORING REQUIRED TO PROTECT EXISTING STRUCTURES, PIPES AND FACILITIES.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL ARCHITECTURAL, MECHANICAL, AND ELECTRICAL ITEMS BEFORE PLACING ANY STRUCTURAL STEEL OR CONCRETE. ALSO, STRUCTURAL DIMENSIONS AND OPENINGS CONTROLLED BY ARCHITECTURAL, MECHANICAL, OR ELECTRICAL EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
- MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES, AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS, THAT ARE REQUIRED BY OTHER CONTRACT DRAWINGS, SHALL BE PROVIDED PRIOR TO CASTING CONCRETE.

### GENERAL PIPELINE NOTES:

- DIMENSIONS TO STRUCTURES, REFERENCED PIPING, PAVING, AND OTHER IMPROVEMENTS IS APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND CONDITIONS 14 DAYS IN ADVANCE OF THE CONSTRUCTION WORK. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER.
- CONTRACTOR SHALL MAINTAIN A MINIMUM CLEARANCE OF 10 FEET HORIZONTAL AND 3 FEET VERTICAL BETWEEN THE SEWER LINES AND EXISTING WATER LINES.
- REFER TO THE GEOTECHNICAL REPORT LOCATED IN THE APPENDIX OF THE SPECIFICATIONS FOR ADDITIONAL INFORMATION ON THE GEOTECHNICAL CONDITIONS AND BORING INFORMATION.
- IN ALL LOCATIONS WHERE TRENCH PLATE IS USED FOR VEHICULAR OR PEDESTRIAN TRAFFIC, THE CONTRACTOR SHALL APPLY SKID RESISTANT COATING ON THE TRENCH PLATES AND COLD MIX ASPHALT CONCRETE AT THE EDGES. THE TRENCH PLATES SHALL BE NOTCHED INTO THE ASPHALT, CONCRETE, OR TRAVELED SURFACE TO PREVENT SLIPPAGE AND ROCKING UNDER TRAFFIC.
- THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES ADJACENT TO THE WORK, THROUGHOUT THE CONSTRUCTION PERIOD.
- ALL OPEN TRENCHES, WORK AREAS AND SHAFTS SHALL HAVE A SHORING SYSTEM IN ACCORDANCE WITH OSHA, STATE AND LOCAL REQUIREMENTS.
- THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, COUNTY, AND LOCAL LAWS AND ORDINANCES RELATING TO THE SAFETY AND CHARACTER OF WORK, EQUIPMENT AND PERSONNEL. THIS INCLUDES BUT IS NOT LIMITED TO SHEETING, SHORING, BRACING, VENTILATION, CONFORMANCE WITH TRAFFIC CONTROL AND MAINTENANCE OF BARRICADES AND WARNING DEVICES.
- LAYOUT DRAWINGS ARE REQUIRED FOR PIPING INSTALLED.
- ALL RIPARIAN AREAS DISTURBED SHALL BE RESTORED PER THE DRAWINGS.**
- ALL ROAD DITCHES, FENCE LINES, PASTURES AND SIMILAR AREAS SHALL BE RESTORED PER SPECIFICATION 02925.
- CONTRACTOR SHALL TAKE ALL PRACTICAL PRECAUTIONS TO MINIMIZE DISTURBANCES TO STREAMS, VEGETATION, TREES AND CROP LANDS. WHEREVER PRACTICAL LEAVE EXISTING TREES AND VEGETATED AREAS UNDISTURBED.

### UTILITY NOTES:

- EXISTING UTILITIES IN THE PROJECT MAY BE IN A FRAGILE CONDITION. THE CONTRACTOR SHALL EXERCISE NECESSARY CAUTION WHEN WORKING NEAR EXISTING UTILITIES.
- PLAN LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES ARE BASED ON RECORD DRAWINGS, POTHOLING AND SURVEY INFORMATION AND ARE CONSIDERED APPROXIMATE ONLY. WHERE NO ELEVATIONS ARE SHOWN, NO INFORMATION WAS AVAILABLE DURING THE DESIGN PERIOD.
- SOME UTILITY SERVICES MAY NOT BE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL TAKE NECESSARY MEASURES TO LOCATE AND PROTECT SERVICE DURING CONSTRUCTION.
- CONTRACTOR SHALL CALL THE "LOCAL UTILITY LOCATOR" AT "811" PRIOR TO ANY EXCAVATION ACTIVITIES.
- THE LOCATION, SIZE, AND MATERIALS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE AND IS SHOWN FOR BIDDING PURPOSES. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT THE UTILITY OWNERS SO THAT THOSE UTILITIES MAY MARK THE LOCATION OF THEIR UTILITIES PRIOR TO ANY EXCAVATION ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE AND PROTECT EXISTING UTILITIES.

### EARTHWORK NOTES:

- CLEAR THE CONSTRUCTION AREA OF NATURAL OBSTRUCTIONS EXISTING FOUNDATIONS, BUILDINGS, FENCES, LUMBER, WALLS, STUMPS, BRUSH, WEEDS, RUBBISH, TREES, BOULDERS, AND ANY OTHER ITEMS WHICH INTERFERES WITH CONSTRUCTION OPERATIONS OR ARE DESIGNATED FOR REMOVAL.
- GRUB OUT AND DISPOSE OF TREE TRUNKS AND ROOT MATERIAL BELOW THE GROUND SURFACE REMAINING AFTER CLEARING.
- DISPOSE OF THE UNACCEPTABLE BACKFILL MATERIAL FROM THE CLEARING AND GRUBBING OPERATIONS AT NO ADDITIONAL COST TO THE OWNER.
- STRIP AND STOCKPILE THE TOPSOIL. THE DEPTH OF STRIPPING SHALL BE ESTIMATED TO BE 12-INCHES BUT WILL BE DETERMINED IN THE FIELD AS SOIL CONDITIONS DICTATE.
- REPLACE STOCKPILED SOIL AND RESTORE SITE AS SPECIFIED.
- ROCK AND AGGREGATE STORAGE AREAS SHALL BE RESTORED BY EXCAVATING ANY SOILS CONTAINING ROCK OR AGGREGATE AND BACKFILLING WITH TOPSOIL. SOIL REMOVED MAY BE USED FOR TRENCH BACKFILL ABOVE THE PIPE ZONE AND 3 FEET BELOW FINISHED GRADE.

**30% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

DESIGNED CE	
DRAWN CE	
CHECKED CE	
DATE APRIL 2023	

REV	DATE	BY	DESCRIPTION

CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
GENERAL

VERIFY SCALES  
BAR IS ONE INCH ON ORIGINAL DRAWING  
0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
DRAWING NO. G03  
SHEET NO. X OF XX

NOTES AND ABBREVIATIONS



Plot Date: 10/5/2022 11:08:46 AM

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### DETAIL REFERENCES

**PLAN**  
SCALE: SCALE  
FILE: FILE  
PLAN NOT REFERENCED

**ELEVATION**  
SCALE: SCALE  
FILE: FILE  
DRAWING CUT ORIGINATION

VIEW TITLE  
DESCRIPTION  
VIEW  
VIEW TITLE

SECTION CUT  
VIEW  
#X## = SEE INDICATED DRAWING  
- = SHOWN ON SAME DRAWING

SECTION OR DETAIL  
VIEW TITLE  
DESCRIPTION  
VIEW  
VIEW TITLE

TITLE W/ REFERENCE  
DRAWING CUT ORIGINATION

DETAIL CALL-OUT (ENLARGED)

VIEW  
#X## = SEE INDICATED DRAWING

AREA DESIGNATOR (WHEN APPLICABLE)  
DISCIPLINE DESIGNATOR  
CONSECUTIVE SHEET NUMBER

TYPICAL DETAIL #

EXTERIOR ELEVATION VIEWS

PHOTO LOCATION  
ARROW INDICATES POINT OF VIEW

GRID BUBBLE

TYPICAL DETAIL #  
TYPICAL DETAIL TITLE  
LINE 1  
LINE 2  
LINE 3

MODIFICATION NOTE  
S = STANDARD  
J = JOB SPECIFIC  
R = REVISED  
N = NOTE TO TYPICAL DETAIL USER

SHT X OF X  
SHEETS IN DETAIL

XX/XX/20XX  
DATE CREATED (REVISED)

### LINE WORK

NEW STRUCTURES OR EDGE OF PAVEMENT	_____
EXISTING STRUCTURES (SCREENED)	_____
NEW PIPING (TRIPLE LINES)	=====
NEW PIPING (SINGLE LINE)	_____
EXISTING PIPING (TRIPLE LINES) (SCREENED)	=====
EXISTING PIPING (SINGLE LINE) (SCREENED)	_____
HIDDEN LINE OR TRAIL EDGE	- - - - -
CENTER, MONUMENT, OR SURVEY LINE	_____
GUARDRAIL	_____
EXISTING CONTOURS (SCREENED)	_____ 310
NEW CONTOURS	_____ 310
NEW FENCE	-X-X-X-
EXISTING FENCE (SCREENED)	-X-X-X-
REMOVE OR ABANDONED (CROSS HATCHING: FENCE SHOWN AS EXAMPLE)	//////
POWER POLE & LINE	OHE PP OHE
CABLE TV (UNDERGROUND)	CTV CTV
FIBER OPTIC	FO FO
FUEL	F F
NATURAL GAS	G G
UNDERGROUND ELECTRIC	UGE UGE
SANITARY SEWER	SS SS
FORCEMAIN SANITARY SEWER	FM FM
STORM DRAIN	SD SD
TELEPHONE	TEL TEL
WATER	W W
PROPERTY LINE OR RIGHT OF WAY	_____
SLOPE	Y Y Y
NEW ROAD	=====
EXISTING ROAD (SCREENED)	=====
FUTURE ROAD, WATER EDGE OR RIDGE	_____
CURB & GUTTER	=====
CURB	=====
SWALE	=====
FLOWLINE	_____
SHORING	~~~~~
RAILROAD TRACKS	
LIMITS OF CONSTRUCTION	LOC LOC
SILT FENCE	SF SF SF
EASEMENT	_____
EXISTING EASEMENT	_____
CITY LIMITS	_____
EXISTING GRADE (PROFILE)	_____
PROPOSED GRADE (PROFILE)	_____
MATCH LINE	MATCH LINE STA XXX SEE DWG XXX

### COORDINATES / ELEVATION

COORDINATES  
N=1600000 E=1000000  
N=XXXXXXXX.XX E=XXXXXXXX.XX

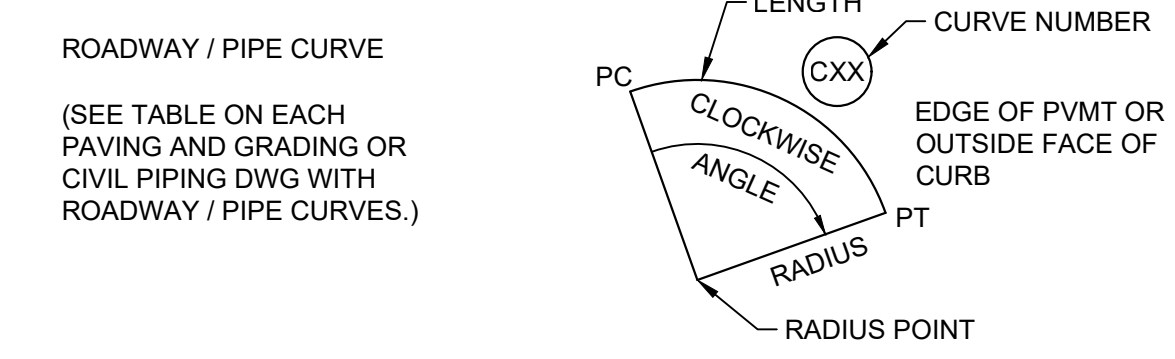
CONTROL POINT  
XX

SPOT ELEVATION  
FG=XX.XX

EXISTING SPOT ELEVATION  
X 1325.00

SLOPE CALLOUT  
2:1 2 1  
2.0% S=0.0020

### ROADWAY / PIPE CURVES



### HATCH PATTERNS

AGGREGATE BASE COURSE (ABC)	[Hatch Pattern]	GRATING	[Hatch Pattern]
ASPHALT PAVING	[Hatch Pattern]	LANDSCAPING	[Hatch Pattern]
(WITH AERIAL)	[Hatch Pattern]	RIPRAP	[Hatch Pattern]
BEDROCK	[Hatch Pattern]	EXISTING/ UNDISTURBED SOIL	[Hatch Pattern]
CLSM	[Hatch Pattern]	STRUCTURAL FILL OR BACKFILL	[Hatch Pattern]
CONCRETE (ALL CLASSES)	[Hatch Pattern]	STEEL	[Hatch Pattern]
DRAIN ROCK	[Hatch Pattern]	STAGING AREA	[Hatch Pattern]
GRAVEL	[Hatch Pattern]	TREAD PLATE	[Hatch Pattern]

### SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	EXISTING CONTROL POINT		CABLE TV		CLEANOUT
	EXISTING MONUMENT		POWER TOWER		AIR RELEASE VALVE
	CONTROL POINT		GATE		BLOW OFF VALVE
	SOIL BORING LOCATIONS		GUARD POST		HOSE BIBB / YARD HYDRANT
	POTHOLE		HEADWALL		SERVICE CONNECTION
	POTHOLE NUMBER		ROCK WALL		BURIED VALVE
	FLOW/SLOPE DIRECTION		SHRUB/HEDGE		FLANGE
	MANHOLE (PLAN)		TREE		BALL VALVE
	MANHOLE (PROFILE)		SIGN/SIGN POST		BUTTERFLY VALVE
	CATCH BASIN		LIGHT		CHECK VALVE
	ELECTRICAL MANHOLE AND PULL BOX		UTILITY POLE		GATE VALVE
	METER BOX		UTILITY POLE GUY WIRE		PLUG VALVE
	PULL BOX		POWER POLE		PIPE CAP OR CONNECTION
	TELEPHONE PEDESTAL		FIRE HYDRANT		REDUCER

NOTE: ALL SYMBOLS SHOWN AS NEW. EXISTING SYMBOLS ARE SCREENED.

BRACKET

BREAK LINE

PIPE BREAK PLAN VIEW

PIPE BREAK CROSS SECTION

SCALE  
0 10' 20' 40'  
SCALE: 1" = 20'

PIPE CONTINUATION (SINGLE LINE)

KEY NOTE

REVISION DELTA

EXISTING ELEVATION EX TOW XXXX.X±

ELEVATION TOC XXXX.XX

EQUIPMENT/DEVICE KEY TAG

EQUIPMENT/DEVICE NUMBER XXX-XX-XXX

PIPE TAG  
\*PIPE SIZE  
FUTURE PIPING (WHERE APPLICABLE)  
\* FOR EXISTING PIPING SHOW AS EX SIZE FLOW STREAM

UNDERGROUND/OVERHEAD WARNING (STATE/REGION SPECIFIC)

**811**  
Know what's below.  
Call before you dig.  
usanorth811.org

Avoid overhead power line contact. It's costly.

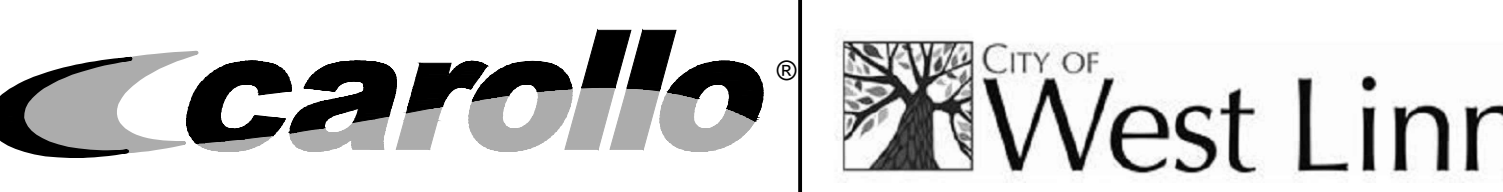
**Call before you OVERHEAD**  
Replace with Regional Phone Number

NORTH ARROW/  
PLANT NORTH

**30% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

REV	DATE	BY	DESCRIPTION
1			
2			
3			

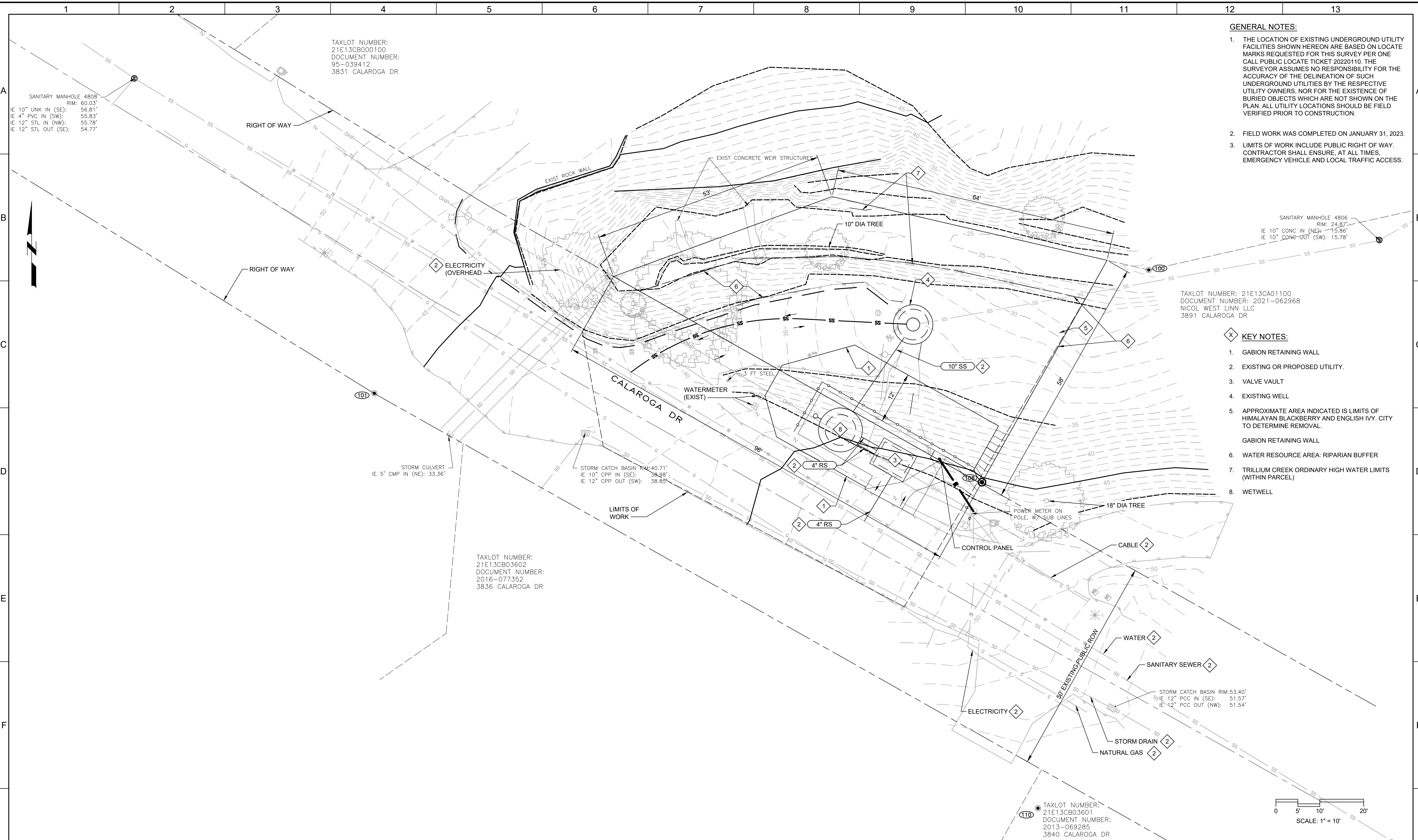
DESIGNED CE
DRAWN CE
CHECKED CE
DATE APRIL 2023



CITY OF WEST LINN		VERIFY SCALES	JOB NO. 201779
CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT		BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. G04
GENERAL		0 1"	SHEET NO. X OF XX
GENERAL AND CIVIL LEGEND AND SYMBOLS		IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	

Plot Date: 10/5/2022 11:08:46 AM

LAST SAVED BY: sraustad



- GENERAL NOTES:**
1. THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS SURVEY PER ONE CALL PUBLIC LOCATE TICKET 20220110. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS, NOR FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  2. FIELD WORK WAS COMPLETED ON JANUARY 31, 2023.
  3. LIMITS OF WORK INCLUDE PUBLIC RIGHT OF WAY. CONTRACTOR SHALL ENSURE, AT ALL TIMES, EMERGENCY VEHICLE AND LOCAL TRAFFIC ACCESS.

- KEY NOTES:**
1. GABION RETAINING WALL
  2. EXISTING OR PROPOSED UTILITY.
  3. VALVE VAULT
  4. EXISTING WELL
  5. APPROXIMATE AREA INDICATED IS LIMITS OF HIMALAYAN BLACKBERRY AND ENGLISH IVY. CITY TO DETERMINE REMOVAL.
- GABION RETAINING WALL
6. WATER RESOURCE AREA: RIPARIAN BUFFER
  7. TRILLIUM CREEK ORDINARY HIGH WATER LIMITS (WITHIN PARCEL)
  8. WETWELL

**30% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

REV	DATE	BY	DESCRIPTION
1			
2			
3			

DESIGNED MSS	
DRAWN ARE	
CHECKED	
DATE APRIL 2023	

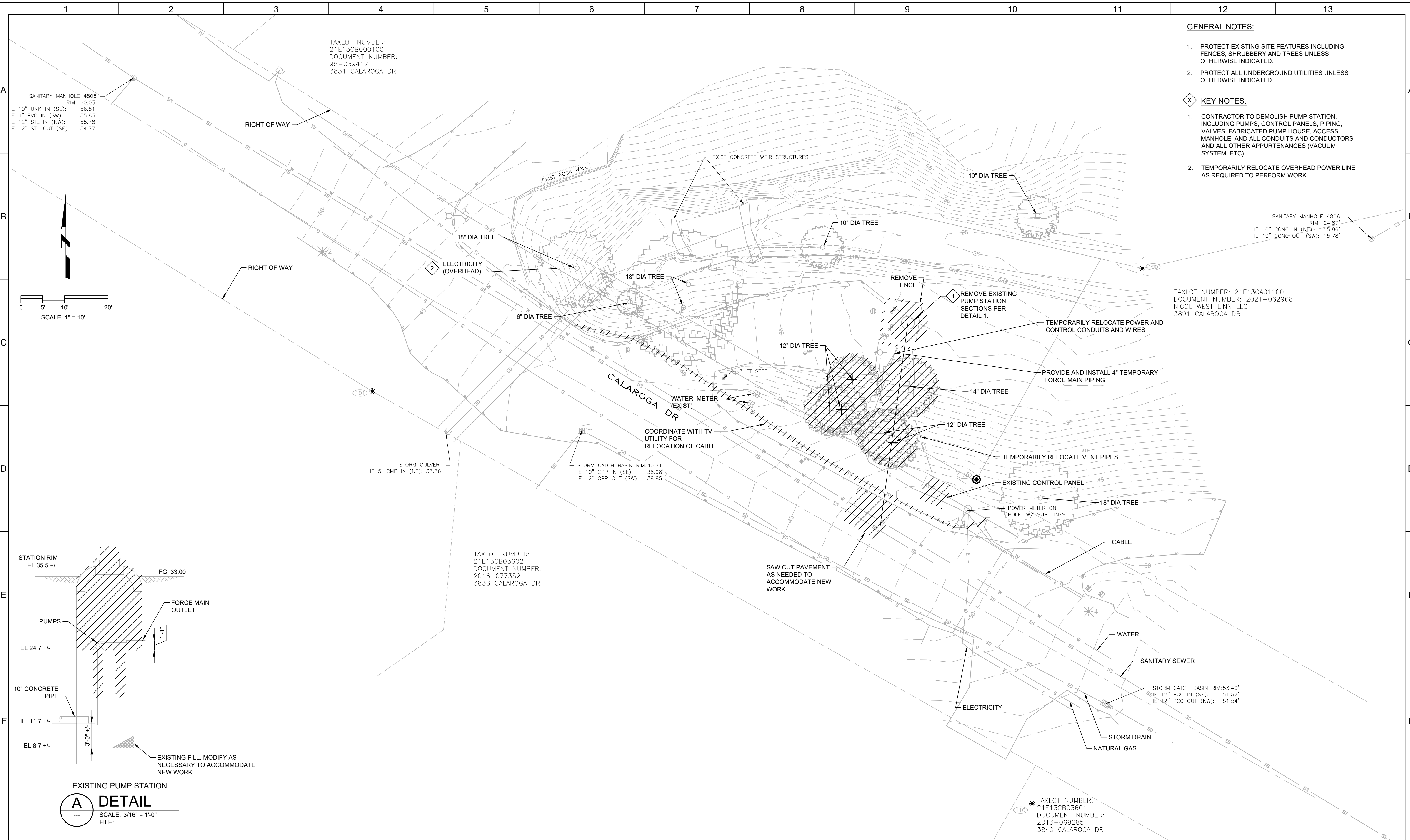


CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT**  
 GENERAL  
**SITE PLAN**

VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. <b>G06</b>
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. X OF XX

Plot Date: 10/5/2022 11:08:46 AM

LAST SAVED BY: gbamba



<b>30% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
DESIGNED	MSS		
DRAWN	ARE		
CHECKED			
DATE	APRIL 2023		
REV	DATE	BY	DESCRIPTION
1			
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DESIGNED	MSS		
DRAWN	ARE		
CHECKED			
DATE	APRIL 2023		



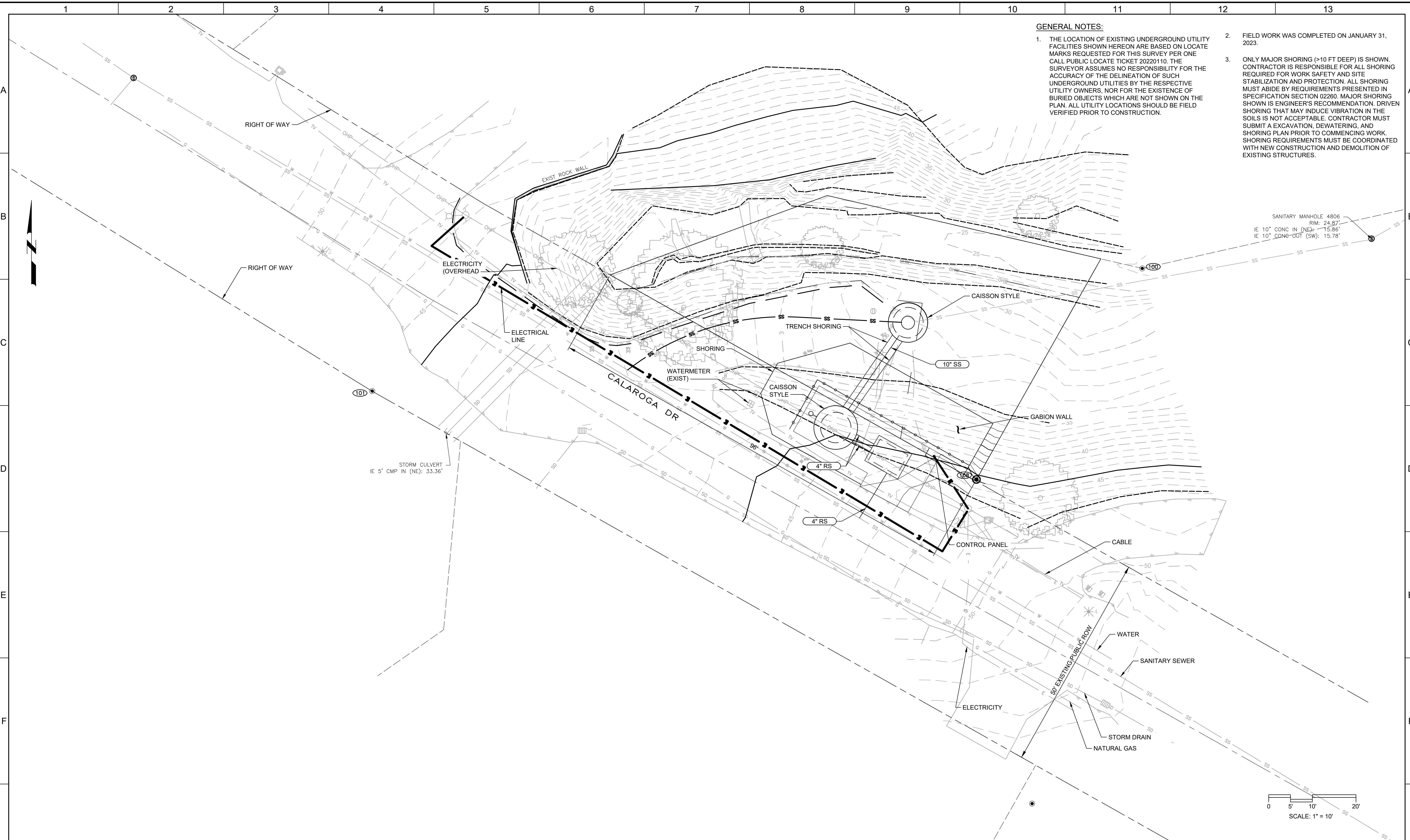
CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT**  
DEMO  
**SITE PLAN**

VERIFY SCALES	JOB NO. 201779
BAR IS ONE INCH ON ORIGINAL DRAWING	DRAWING NO. D01
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	SHEET NO. X OF XX

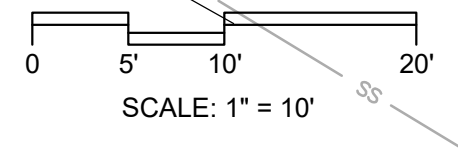
Plot Date: 10/5/2022 11:08:46 AM

**GENERAL NOTES:**

1. THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS SURVEY PER ONE CALL PUBLIC LOCATE TICKET 20220110. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS. NOR FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. FIELD WORK WAS COMPLETED ON JANUARY 31, 2023.
3. ONLY MAJOR SHORING (>10 FT DEEP) IS SHOWN. CONTRACTOR IS RESPONSIBLE FOR ALL SHORING REQUIRED FOR WORK SAFETY AND SITE STABILIZATION AND PROTECTION. ALL SHORING MUST ABIDE BY REQUIREMENTS PRESENTED IN SPECIFICATION SECTION 02260. MAJOR SHORING SHOWN IS ENGINEER'S RECOMMENDATION. DRIVEN SHORING THAT MAY INDUCE VIBRATION IN THE SOILS IS NOT ACCEPTABLE. CONTRACTOR MUST SUBMIT AN EXCAVATION, DEWATERING, AND SHORING PLAN PRIOR TO COMMENCING WORK. SHORING REQUIREMENTS MUST BE COORDINATED WITH NEW CONSTRUCTION AND DEMOLITION OF EXISTING STRUCTURES.



SANITARY MANHOLE 4806  
 RIM: 24.87'  
 IE 10" CONC IN (NE): 15.86'  
 IE 10" CONC-OUT (SW): 15.78'



LAST SAVED BY: sraustad

<b>30% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
REV	DATE	BY	DESCRIPTION

DESIGNED MSS	
DRAWN SCR	
CHECKED	
DATE APRIL 2023	



CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 CIVIL

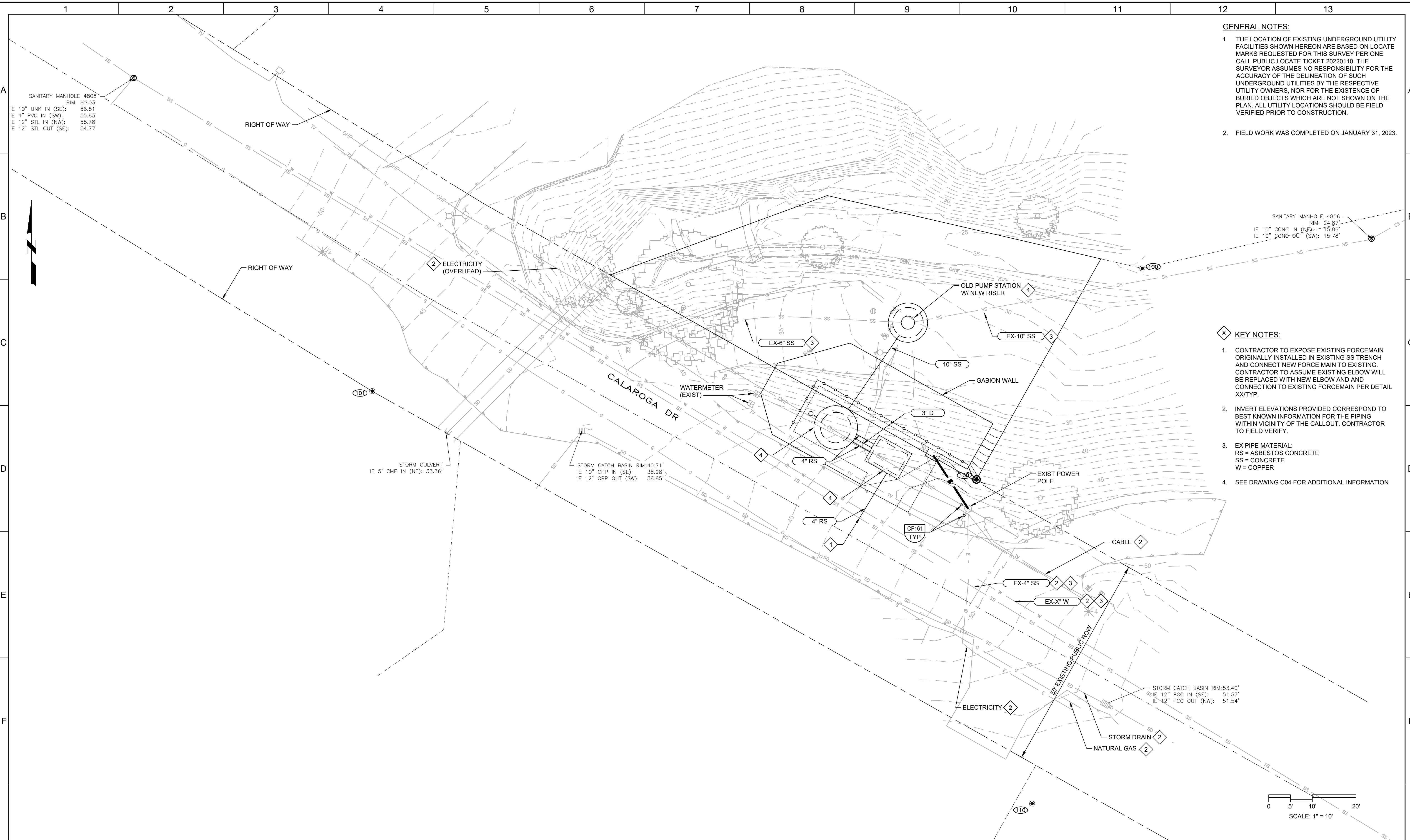
**SITE PLAN**

VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201779 DRAWING NO. <b>C02</b> SHEET NO. X OF XX
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Plot Date: 10/5/2022 11:08:46 AM

LAST SAVED BY: sraustad

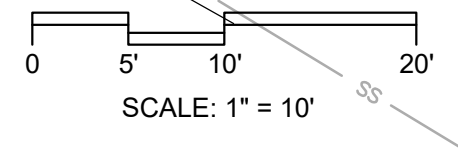


**GENERAL NOTES:**

1. THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS SURVEY PER ONE CALL PUBLIC LOCATE TICKET 20220110. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS, NOR FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. FIELD WORK WAS COMPLETED ON JANUARY 31, 2023.

**KEY NOTES:**

1. CONTRACTOR TO EXPOSE EXISTING FORCEMAIN ORIGINALLY INSTALLED IN EXISTING SS TRENCH AND CONNECT NEW FORCE MAIN TO EXISTING. CONTRACTOR TO ASSUME EXISTING ELBOW WILL BE REPLACED WITH NEW ELBOW AND AND CONNECTION TO EXISTING FORCEMAIN PER DETAIL XX/TYP.
2. INVERT ELEVATIONS PROVIDED CORRESPOND TO BEST KNOWN INFORMATION FOR THE PIPING WITHIN VICINITY OF THE CALLOUT. CONTRACTOR TO FIELD VERIFY.
3. EX PIPE MATERIAL:  
RS = ASBESTOS CONCRETE  
SS = CONCRETE  
W = COPPER
4. SEE DRAWING C04 FOR ADDITIONAL INFORMATION



<b>30% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</b>			
REV	DATE	BY	DESCRIPTION

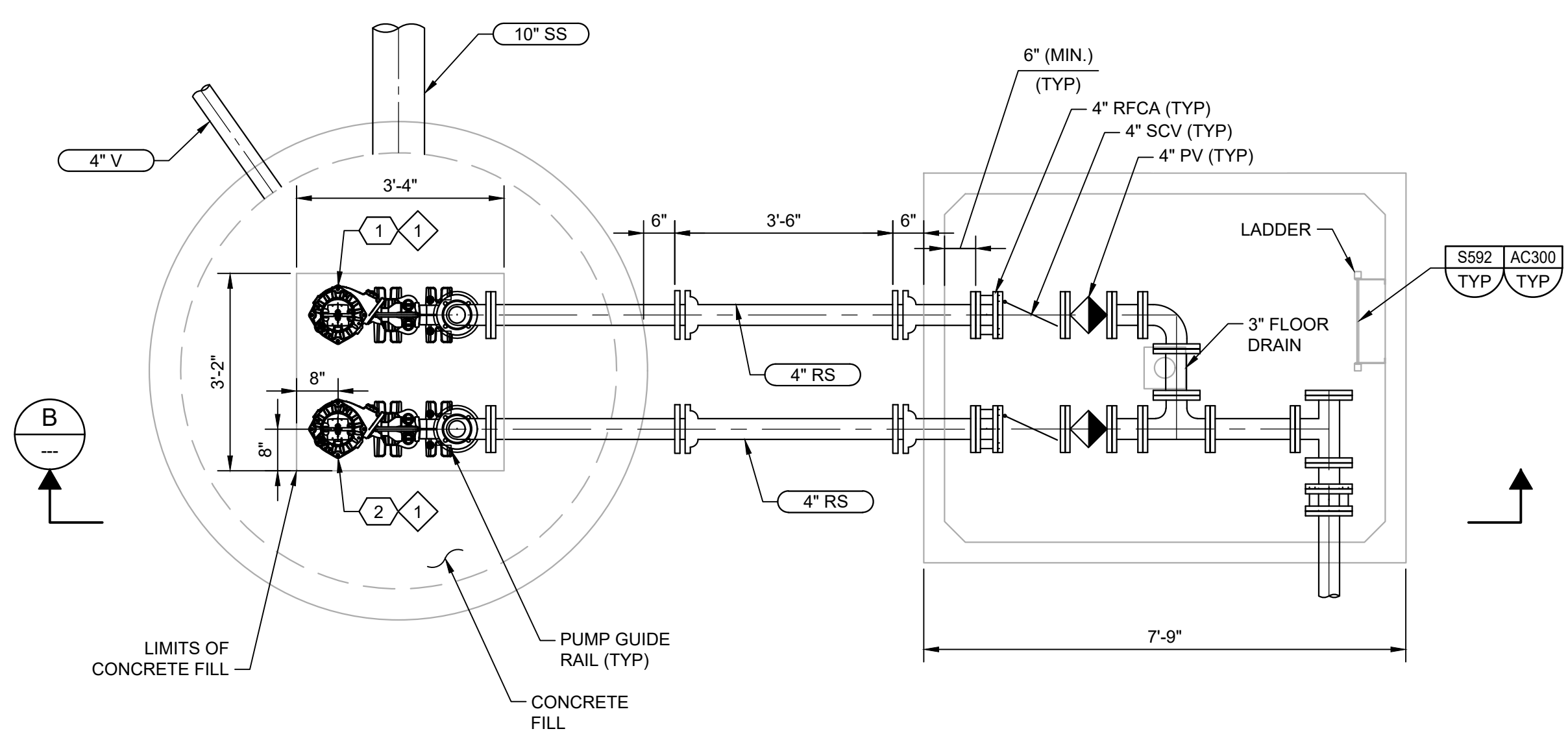
DESIGNED MSS	
DRAWN ARE	
CHECKED	
DATE APRIL 2023	



CITY OF WEST LINN  
**CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT**  
 CIVIL  
**YARD PIPING PLAN**

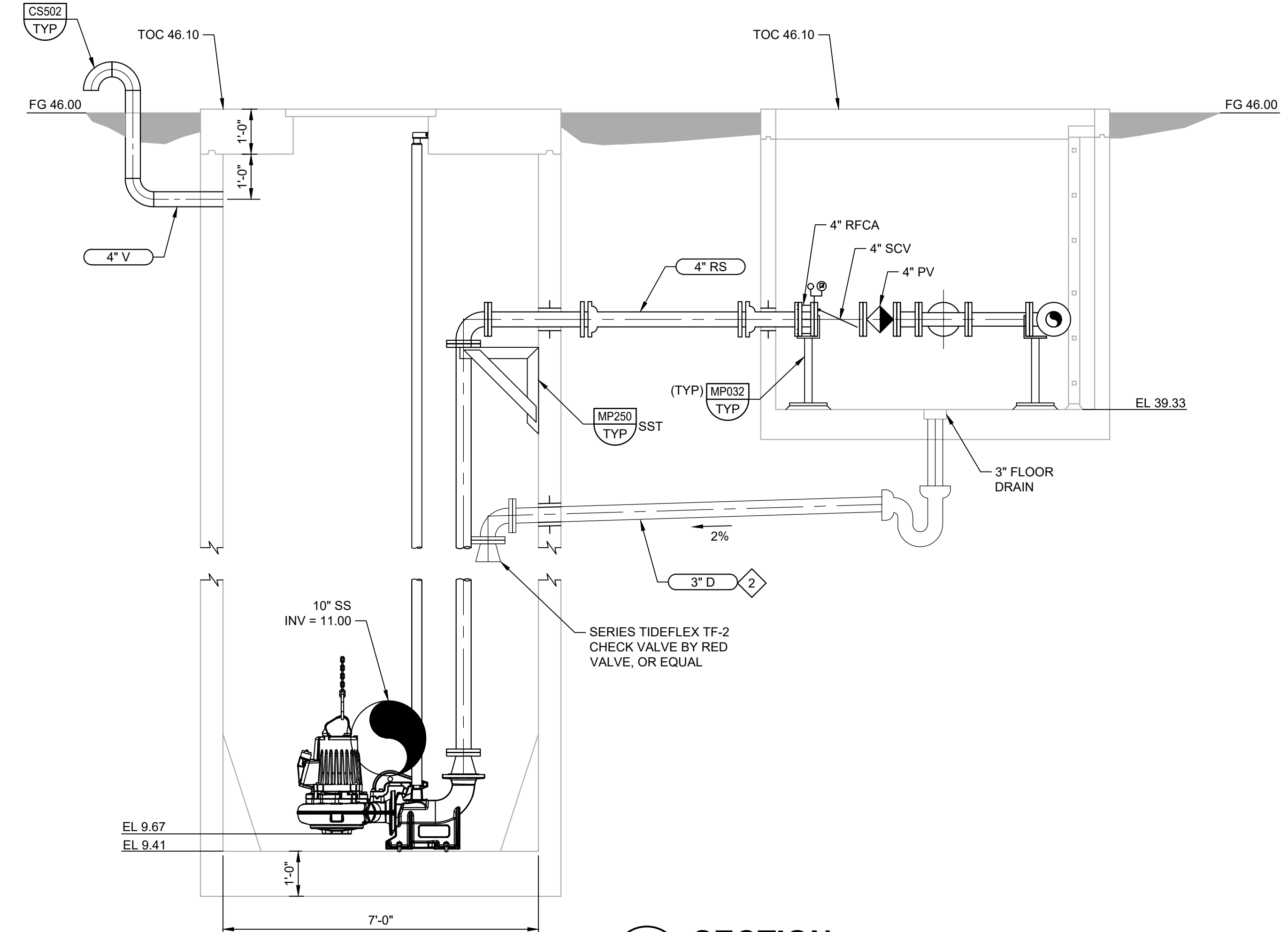
VERIFY SCALES BAR IS ONE INCH ON ORIGINAL DRAWING 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY	JOB NO. 201779 DRAWING NO. <b>C03</b> SHEET NO. X OF XX
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Plot Date: 9/12/2022 7:29:07 AM

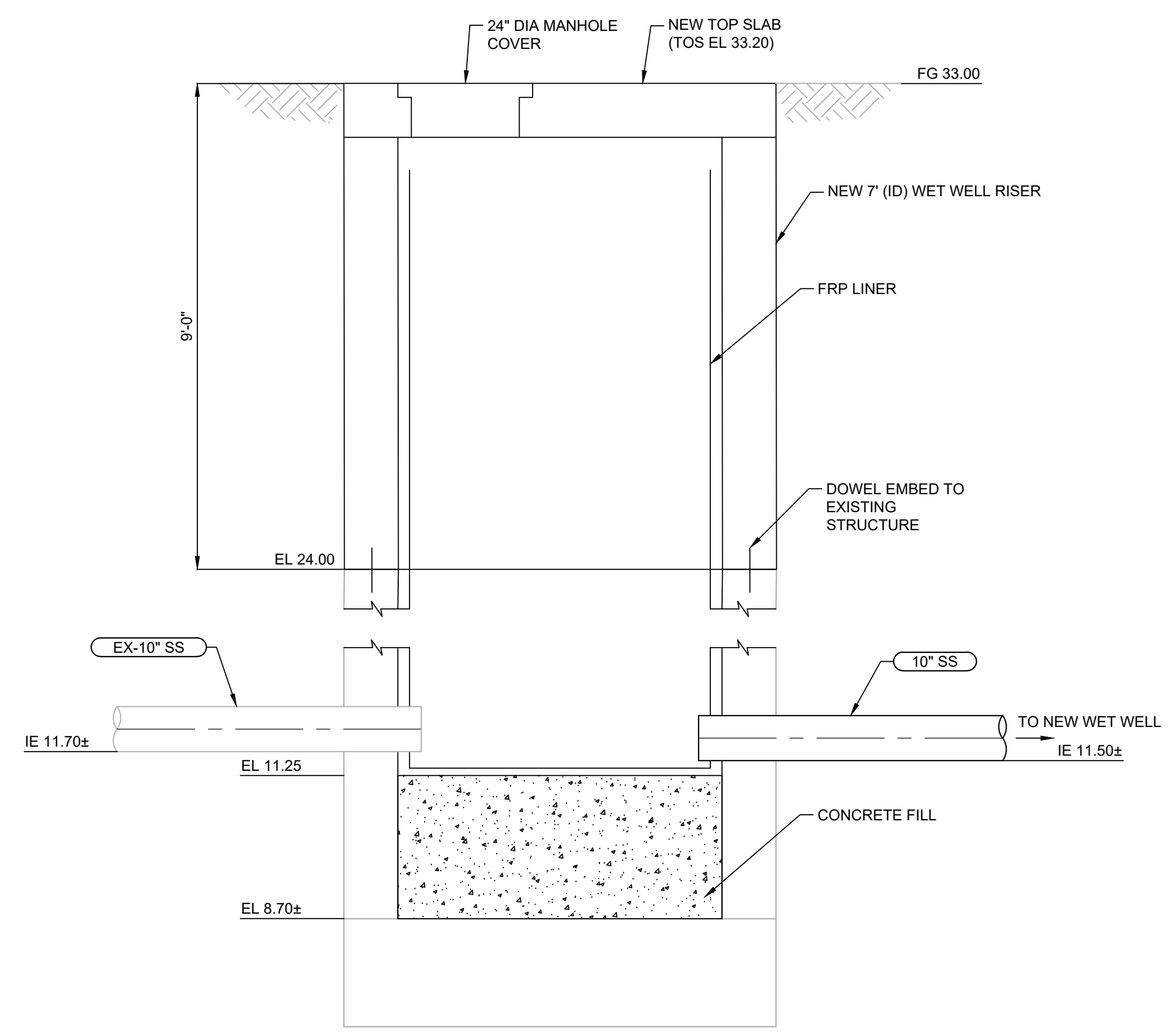


**A PLAN**  
SCALE: 1/2"=1'-0"  
FILE: 8709A12201M106

- KEY NOTES:**
- SUBMERSIBLE LARGE CAPACITY CENTRIFUGAL PUMP. SEE SPECIFICATION SECTION 11312G FOR REQUIREMENTS.
  - SLOPE PIPE CONTINUOUSLY IN DIRECTION INDICATED.
- KEY TAGS:**
- 1 PMP-001  
2 PMP-001



**B SECTION**  
SCALE: 1/2"=1'-0"  
FILE: 8709A12201M306



**C SECTION**  
SCALE: 3/8"=1'-0"  
FILE: 8709A12201M306

LAST SAVED BY: aricardo

**30% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

DESIGNED DES  
DRAWN DWN  
CHECKED CHK  
DATE APRIL 2023



CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT  
CIVIL  
PUMP STATION, VALVE VAULT, AND WET WELL PLAN AND SECTIONS

VERIFY SCALES  
BAR IS ONE INCH ON ORIGINAL DRAWING  
0 1"  
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 201779  
DRAWING NO. C04  
SHEET NO. X OF XX

## Appendix B:

- FIRM Panel 41005C0019D
- FEMA Willamette River Flood Profile
- FIS Study Table 5 Summary of Discharges
- HEC2 Existing Model

**NOTES TO USERS**

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 10. The horizontal datum was NAD83, GRS1990 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

NGS Information Services  
NOAA, NNGS12  
National Geodetic Survey  
SSMC-3, #9202  
1315 East-West Highway  
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov/>.

Base map information shown on this FIRM was derived from multiple sources. High resolution color orthophotos produced by Merrick & Co., Pixures, Inc., and Clean Water Services covered portions of the county. USGS Digital Quadrangles at a scale of 1:12000 or less dated 6/20/94 covered the remainder of the county.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

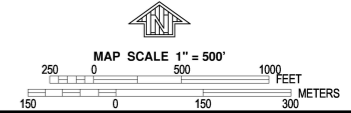
Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://www.msc.fema.gov/>.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/>.



**LEGEND**

- SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD**
- The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
  - ZONE AE** Base Flood Elevations determined.
  - ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
  - ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
  - ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
  - ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
  - ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
  - ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.
- OTHER FLOOD AREAS**
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
  - ZONE D** Areas in which flood hazards are undetermined, but possible.
- COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**
- OTHERWISE PROTECTED AREAS (OPAs)**
- CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.
- 1% annual chance floodplain boundary
  - 0.2% annual chance floodplain boundary
  - Floodway boundary
  - Zone D boundary
  - CBRS and OPA boundary
  - Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities
  - Base Flood Elevation line and value; elevation in feet\*
  - Base Flood Elevation value where uniform within zone; elevation in feet\*
- \* Referenced to the North American Vertical Datum of 1988 (NAVD 88)
- Cross section line
  - Transect line
  - Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
  - 1000-meter Universal Transverse Mercator grid ticks, zone 10
  - 5000-foot grid ticks: Oregon State Plane coordinate system, north zone (FIPSZONE 3601), Lambert Conformal Conic
  - Bench mark (see explanation in Notes to Users section of this FIRM panel)
  - River Mile
  - MAP REPOSITORIES
  - Refer to Map Repositories list on Map Index
- EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP: June 17, 2008  
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
- For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.
- To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



**NFIP**

**PANEL 0019D**

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**CLACKAMAS COUNTY,**  
**OREGON**  
**AND INCORPORATED AREAS**

**PANEL 19 OF 1175**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

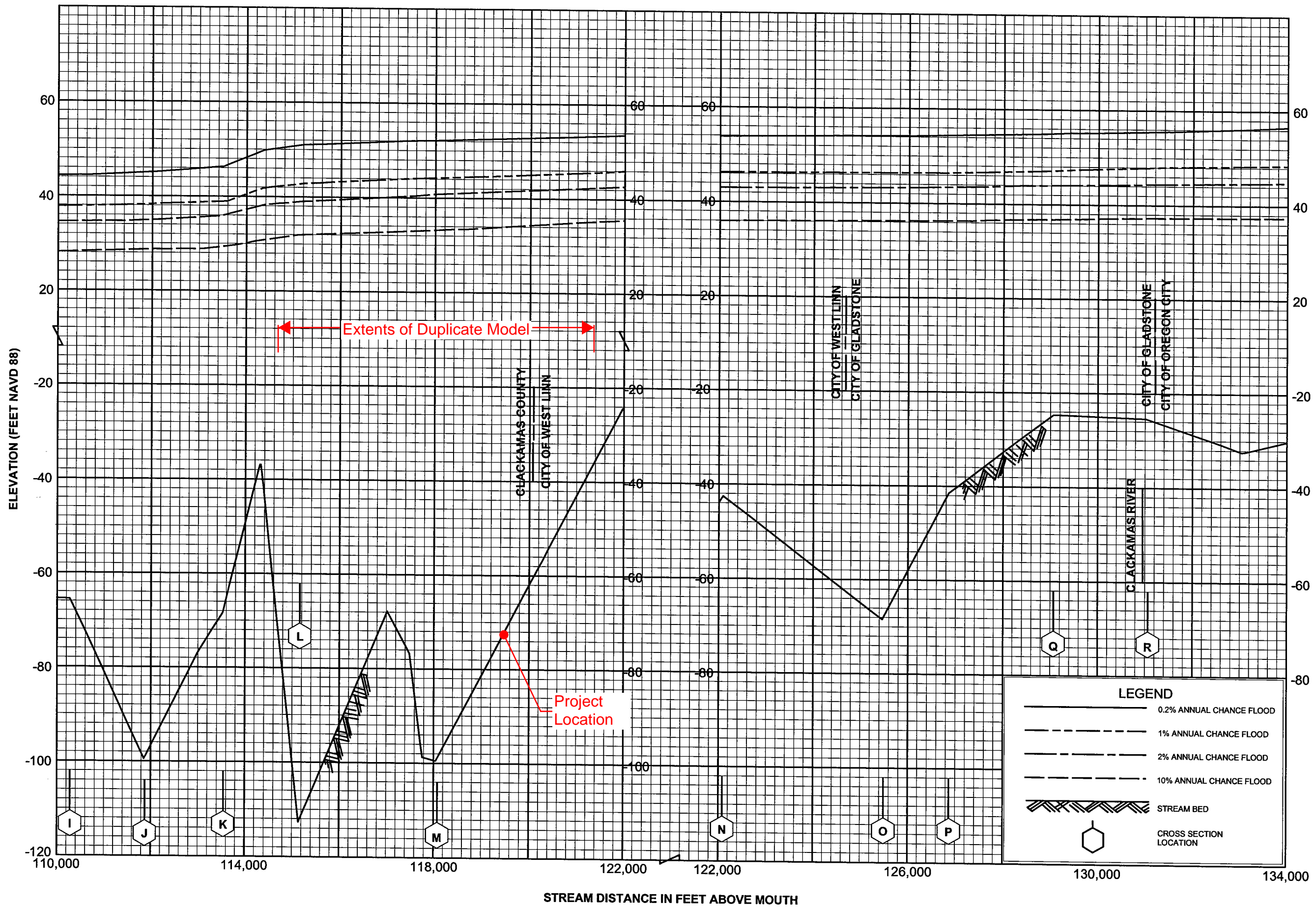
COMMUNITY	NUMBER	PANEL	SUFFIX
CLACKAMAS COUNTY	410088	0019	D
LAKE OSWEGO, CITY OF	410018	0019	D
WEST LINN, CITY OF	410024	0019	D

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
**41005C0019D**

**EFFECTIVE DATE**  
**JUNE 17, 2008**

**Federal Emergency Management Agency**



FLOOD PROFILES  
WILLAMETTE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**CLACKAMAS COUNTY, OR**  
AND INCORPORATED AREAS

Table 5 - Summary of Discharges (continued)

Peak Discharge (cfs)

<u>Flooding Source and Location</u>	<u>Drainage Area (Square Miles)</u>	<u>10-Percent- Annual-Chance</u>	<u>2-Percent- Annual-Chance</u>	<u>1-Percent- Annual-Chance</u>	<u>0.2-Percent- Annual-Chance</u>
Tualatin River					
At month	706.0	15,750	24,200	27,900	36,000
Downstream of overflow through Rivergrove	698	16,000	28,800	30,700	42,200
Downstream of confluence with Nyberg Slough	698.0	16,000	26,900	33,600	48,500
Tualatin River overflow to Rivergrove	<sup>1</sup>	<sup>1</sup>	1,100	2,900	6,300
<b>Willamette River</b>					
<b>At Milwaukie</b>	11,130	251,000	329,000	375,000	495,000
At Willamette Locks Upper Gage	10,100	219,000	295,000	341,000	469,000
At Fish Eddy	9,300	209,200	284,200	328,000	457,000
At downstream of Wilsonville corporate limits	8,400	178,000	250,000	287,000	420,000
Zigzag River					
At mouth	60.0	7,800	11,500	13,100	17,400
Upstream of confluence with Still Creek	30.0	4,300	6,300	9,800	10,400

<sup>1</sup> Data not available<sup>2</sup> Data not computed

# FEMA Engineering Library Digitized Data Index

CID:415588

Community:CLACKAMAS COUNTY\*

County:CLACKAMAS COUNTY

State:OREGON

Case Number/ Study ID:415588-19870804

Description:1e. Type 19 Restudy

Revision Status:

Flooding Source(s):Willamette River



0394875

Box:

Doc:

Effective Date:8/4/1987

Contents:09. Engineering Analysis: Hydraulics (riverine, stillwater, LDS)

Notes:4 models cover entire reach: A-L; M-R; S-U; V-AO

Scanned by:

Scan Date:

QC Staff:

QC Date:

X1	16.580	32.000	155.000	1360.000	1400.000	1332.000	1400.000	195.000	0.0	0.0
GR	60.000	0.0	0.0	75.000	40.000	180.000	30.000	30.000	20.000	210.000
GR	10.000	240.000	5.000	265.000	-23.000	520.000	-24.000	550.000	-25.000	620.000
GR	-21.000	650.000	-22.000	700.000	-24.000	750.000	-31.000	800.000	-27.000	840.000
GR	-27.000	890.000	-20.000	920.000	-17.000	960.000	-19.000	980.000	-19.000	1020.000
GR	-24.000	1050.000	-28.000	1070.000	-31.000	1100.000	-35.000	1130.000	-28.000	1170.000
GR	-23.000	1190.000	5.000	1300.000	10.000	1330.000	20.000	1350.000	30.000	1360.000
GR	40.000	1370.000	48.000	1500.000	0.0	0.0	0.0	0.0	0.0	0.0

X1	16.620	0.0	0.0	0.0	200.000	200.000	200.000	0.0	0.0	0.0
2540 X1 CARD,GIVEN PXSECR=0,ASSUMED PXSECR=1,SECD=	16.620									
S8	1.200	1.500	2.500	0.0	650.000	57.000	94950.000	6.500	-30.000	-30.000
X1	16.630	0.0	0.0	0.0	50.000	50.000	50.000	0.0	0.0	0.0

2540 X1 CARD,GIVEN PXSECR=0,ASSUMED PXSECR=1,SECD=	16.630									
X2	0.0	0.0	1.000	55.000	75.000	0.0	0.0	0.0	0.0	0.0
QT	4.000	153000.000	272000.000	375000.000	495000.000	0.0	0.0	0.0	0.0	0.0
X1	16.740	26.000	165.000	1580.000	800.000	500.000	583.000	0.0	0.0	0.0
GR	60.000	0.0	50.000	45.000	40.000	60.000	30.000	105.000	20.000	165.000
GR	10.000	225.000	5.000	250.000	-17.000	490.000	-23.000	560.000	-26.000	610.000
GR	-55.000	650.000	-50.000	690.000	-44.000	720.000	-44.000	760.000	-40.000	820.000
GR	-51.000	870.000	-20.000	1050.000	-24.000	1200.000	-28.000	1350.000	-2.000	1500.000
GR	5.000	1550.000	10.000	1560.000	20.000	1580.000	30.000	1600.000	40.000	1610.000
GR	50.000	1625.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	17.360	40.000	66.000	1030.000	3300.000	3200.000	3255.000	0.0	0.0	0.0
GR	50.000	0.0	40.000	38.000	30.000	53.000	20.000	66.000	10.000	90.000
GR	-2.100	142.000	-7.100	178.000	-11.100	213.000	-17.100	230.000	-24.100	265.000
GR	-35.100	300.000	-42.100	336.000	-51.100	353.000	-57.100	388.000	-64.100	423.000
GR	-60.100	459.000	-54.100	494.000	-49.100	529.000	-51.100	564.000	-50.100	600.000
GR	-55.100	634.000	-58.100	669.000	-48.100	704.000	-51.100	722.000	-43.100	757.000
GR	-34.100	792.000	-27.100	827.000	-12.100	845.000	-6.100	880.000	-4.100	915.000
GR	10.000	950.000	20.000	1030.000	28.000	1100.000	30.000	1220.000	32.000	1290.000
GR	34.000	1330.000	36.000	1390.000	38.000	1430.000	40.000	1450.000	50.000	1520.000

Peak discharge  
10 yr  
50 yr  
100 yr  
500 yr

QT	4.000	153000.000	329000.000	375000.000	495000.000	0.0	0.0	0.0	0.0	0.0
X1	17.830	22.000	60.000	1045.000	2500.000	2500.000	2500.000	0.0	0.0	0.0
GR	70.000	0.0	60.000	25.000	50.000	40.000	30.000	50.000	20.000	60.000
GR	10.000	90.000	5.000	110.000	-20.000	230.000	-64.000	440.000	-67.000	510.000
GR	-71.000	560.000	-64.000	610.000	-69.000	650.000	-47.000	710.000	-54.000	750.000
GR	5.000	940.000	10.000	960.000	20.000	1010.000	30.000	1045.000	30.000	1135.000
GR	40.000	1165.000	50.000	1750.000	0.0	0.0	0.0	0.0	0.0	0.0

QT	4.000	251000.000	329000.000	375000.000	495000.000	0.0	0.0	0.0	0.0	0.0
X1	18.310	22.000	200.000	1015.000	3000.000	2300.000	2530.000	0.0	0.0	0.0
GR	45.000	0.0	40.000	25.000	30.000	100.000	20.000	200.000	10.000	265.000
GR	5.000	280.000	-21.000	410.000	-29.000	460.000	-45.000	520.000	-55.000	570.000
GR	-67.000	620.000	-70.000	670.000	-81.000	690.000	-75.000	720.000	-62.000	760.000
GR	-48.000	820.000	5.000	955.000	10.000	960.000	20.000	1015.000	30.000	1035.000
GR	40.000	1045.000	50.000	1220.000	0.0	0.0	0.0	0.0	0.0	0.0

NC	0.0	0.0	0.035	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	18.630	30.000	220.000	1545.000	700.000	2500.000	1690.000	0.0	0.0	0.0
GR	50.000	0.0	40.000	30.000	30.000	190.000	20.000	220.000	10.000	265.000
GR	5.000	290.000	-10.000	420.000	-4.000	530.000	-8.000	570.000	-5.000	630.000
GR	-11.000	680.000	-30.000	720.000	-56.000	780.000	-70.000	830.000	-85.000	890.000
GR	-78.000	930.000	-59.000	980.000	-51.000	1070.000	-61.000	1110.000	-68.000	1160.000
GR	-56.000	1220.000	-38.000	1300.000	-34.000	1330.000	-33.000	1390.000	5.000	1505.000
GR	10.000	1525.000	20.000	1545.000	30.000	1565.000	40.000	1720.000	40.000	1820.000

X1	19.100	31.000	25.000	1530.000	2300.000	2200.000	2480.000	0.0	0.0	0.0
GR	50.000	0.0	10.000	25.000	5.000	33.000	-57.000	140.000	-72.000	195.000
GR	-70.000	250.000	-62.000	315.000	-69.000	370.000	-67.000	415.000	-54.000	470.000
GR	-24.000	540.000	5.000	620.000	10.000	630.000	20.000	972.000	30.000	1102.000
GR	36.000	1180.000	36.000	1300.000	30.000	1315.000	20.000	1335.000	19.000	1365.000
GR	10.000	1530.000	12.000	1545.000	14.000	1590.000	16.000	1665.000	16.000	1750.000
GR	10.000	1760.000	10.000	1900.000	20.000	1912.000	30.000	2115.000	40.000	2175.000
GR	50.000	2225.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	19.860	53.000	375.000	1375.000	3200.000	4400.000	4118.000	0.0	0.0	0.0
GR	60.000	0.0	50.000	20.000	40.000	52.000	30.000	70.000	29.500	110.000



GR	-70.000	250.000	-62.000	315.000	-69.000	370.000	-67.000	415.000	-54.000	470.000
GR	-24.000	540.000	5.000	620.000	10.000	630.000	20.000	972.000	30.000	1102.000
GR	36.000	1180.000	36.000	1300.000	30.000	1315.000	20.000	1335.000	10.000	1365.000
GR	10.000	1530.000	12.000	1545.000	14.000	1590.000	16.000	1665.000	16.000	1750.000
GR	10.000	1760.000	10.000	1900.000	20.000	1912.000	30.000	2115.000	40.000	2175.000
GR	50.000	2225.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

X1	19.880	53.000	375.000	1375.000	3200.000	4400.000	4118.000	0.0	0.0	0.0
GR	60.000	0.0	50.000	20.000	40.000	52.000	30.000	70.000	29.500	110.000
GR	30.000	375.000	20.000	450.000	10.000	495.000	5.000	530.000	0.900	611.000
GR	-9.100	638.000	-21.100	666.000	-24.100	692.000	-29.100	720.000	-34.100	733.000
GR	-30.100	747.000	-27.100	774.000	-32.100	801.000	-37.100	828.000	-44.100	855.000
GR	-48.100	882.000	-50.100	909.000	-48.100	936.000	-47.100	950.000	-47.100	950.000
GR	-49.100	977.000	-46.100	991.000	-40.100	1018.000	-36.100	1045.000	-32.100	1072.000
GR	-28.100	1099.000	-25.100	1113.000	-23.100	1140.000	-23.100	1167.000	-22.100	1180.000
GR	-21.100	1208.000	-21.100	1221.000	-24.100	1248.000	-19.100	1275.000	-17.100	1302.000
GR	-12.100	1316.000	-11.100	1343.000	-11.100	1351.000	5.000	1370.000	5.000	1371.000
GR	10.000	1375.000	20.000	1405.000	30.000	1425.000	31.000	1490.000	40.000	1665.000
GR	42.000	1710.000	44.000	1720.000	50.000	1745.000	0.0	0.0	0.0	0.0

X1	20.020	21.000	95.000	890.000	800.000	600.000	740.000	0.0	0.0	0.0
GR	50.000	0.0	50.000	95.000	40.000	108.000	30.000	115.000	20.000	125.000
GR	10.000	135.000	5.000	175.000	-17.000	190.000	-54.000	230.000	-70.000	290.000
GR	-63.000	340.000	-61.000	370.000	-54.000	430.000	-56.000	500.000	5.000	765.000
GR	10.000	766.000	20.000	845.000	30.000	890.000	40.000	1235.000	50.000	1330.000
GR	60.000	1420.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SB 0.900 1.500 2.500 0.0 245.000 95.000 80800.000 2.700 -60.000 -60.000  
X1 20.030 0.0 0.0 0.0 50.000 50.000 50.000 0.0 0.0 0.0  
2540 X1 CARD,GIVEN PXSECR=0,ASSUMED PXSECR=1,SECNC= 20.030

X2	0.0	0.0	1.000	65.000	70.000	0.0	0.0	0.0	0.0	0.0
X1	20.160	50.000	580.000	1620.000	700.000	700.000	700.000	0.0	0.0	0.0
X3	0.0	0.0	0.0	725.000	0.0	0.0	0.0	60.000	0.0	0.0
GR	50.000	0.0	40.000	10.000	38.000	40.000	36.000	50.000	34.000	60.000
GR	32.000	90.000	30.000	100.000	26.000	120.000	26.000	400.000	28.000	440.000
GR	28.000	530.000	26.000	570.000	20.000	580.000	10.000	620.000	-53.000	965.000
GR	-60.000	1000.000	-63.000	1032.000	-63.000	1064.000	-64.000	1095.000	-60.000	1111.000
GR	-67.000	1143.000	-65.000	1175.000	-64.000	1191.000	-63.000	1222.000	-62.000	1238.000
GR	-62.000	1270.000	-61.000	1286.000	-61.000	1317.000	-54.000	1349.000	-39.000	1365.000
GR	-25.000	1397.000	-9.000	1412.000	10.000	1460.000	12.000	1470.000	14.000	1480.000
GR	16.000	1510.000	18.000	1560.000	20.000	1620.000	22.000	1625.000	24.000	1730.000
GR	26.000	1810.000	28.000	1830.000	30.000	1860.000	30.000	1950.000	52.000	2020.000
GR	34.000	2050.000	36.000	2100.000	38.000	2120.000	40.000	2125.000	50.000	2200.000

X1	20.890	36.000	200.000	1055.000	4419.000	3978.000	3843.000	0.0	0.0	0.0
X3	10.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GR	60.000	0.0	50.000	10.000	40.000	50.000	30.000	155.000	20.000	200.000
GR	12.000	250.000	10.000	250.000	8.000	450.000	-4.000	594.000	-5.000	626.000
GR	-5.000	658.000	-13.000	690.000	-20.000	706.000	-28.000	738.000	-34.000	770.000
GR	-50.000	803.000	-67.000	835.000	-69.000	867.000	-65.000	899.000	-59.000	930.000
GR	-54.000	947.000	-30.000	979.000	-12.000	1011.000	-6.000	1043.000	8.000	1070.000
GR	10.000	1075.000	12.000	1080.000	20.000	1095.000	30.000	1115.000	40.000	1135.000
GR	40.000	1675.000	30.000	1700.000	20.000	1730.000	20.000	2170.000	40.000	2225.000
GR	60.000	2270.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

NC	0.100	0.100	0.065	0.400	0.600	0.0	0.0	0.0	0.0	0.0
X1	21.200	25.000	138.000	688.000	2200.000	1200.000	1600.000	0.0	0.0	0.0
GR	80.000	0.0	20.000	138.000	10.000	167.000	5.000	180.000	-8.000	196.000
GR	-9.000	227.000	-13.000	258.000	-29.000	290.000	-75.000	321.000	-96.000	352.000
GR	-100.000	415.000	-102.000	431.000	-103.000	462.000	-96.000	493.000	-80.000	525.000
GR	-56.000	556.000	-28.000	587.000	5.000	650.000	10.000	660.000	30.000	689.000
GR	40.000	735.000	42.000	740.000	44.000	861.000	44.000	1080.000	50.000	1550.000

3720 EL OF 80.00 IS ABOVE MIN OF -103.00, BY 183.00 FT,SECNC= 21.200  
3720 EL OF 50.00 IS ABOVE MIN OF -103.00, BY 153.00 FT,SECNC= 21.200

X1	21.400	32.000	190.000	850.000	1100.000	1100.000	1100.000	0.0	0.0	0.0
GR	60.000	0.0	50.000	40.000	50.000	55.000	48.000	105.000	48.000	140.000
GR	46.000	175.000	40.000	190.000	10.000	240.000	5.000	255.000	-8.000	306.000
GR	-11.000	331.000	-14.000	344.000	-26.000	369.000	-51.000	382.000	-68.000	407.000
GR	-76.000	432.000	-79.000	458.000	-81.000	483.000	-76.000	508.000	-73.000	534.000

GR	30.000	330.000	21.000	42.000	21.000	44.000	21.200	44.000	1080.000	50.000	1550.000
GR	40.000	735.000	42.000	42.000	21.000	44.000	21.200	44.000	1080.000	50.000	1550.000
EL OF	80.00	IS ABOVE MIN OF	-103.00,	BY	183.00	FT,SE	21.200				
EL OF	50.00	IS ABOVE MIN CF	-103.00,	BY	153.00	FT,SE	21.200				

X1	21.400	32.000	190.000	850.000	1100.000	1100.000	1100.000	0.0	0.0	0.0
GR	60.000	0.0	52.000	40.000	50.000	55.000	48.000	105.000	48.000	140.000
GR	46.000	175.000	40.000	190.000	10.000	240.000	5.000	255.000	-8.000	306.000
GR	-11.000	331.000	-14.000	344.000	-26.000	369.000	-51.000	382.000	-68.000	407.000
GR	-76.000	432.000	-79.000	458.000	-81.000	483.000	-76.000	508.000	-73.000	534.000
GR	-51.000	546.000	-21.000	572.000	-8.000	584.000	5.000	660.000	10.000	680.000
GR	20.000	720.000	30.000	810.000	40.000	850.000	42.000	860.000	42.000	1380.000
GR	50.000	1445.000	60.000	1480.000	0.0	0.0	0.0	0.0	0.0	0.0

X1	21.500	40.000	200.000	720.000	528.000	528.000	528.000	0.0	0.0	0.0
GR	60.000	0.0	50.000	35.000	48.000	48.000	46.000	57.000	44.000	62.000
GR	42.000	68.000	40.000	100.000	38.000	110.000	32.000	130.000	30.000	190.000
GR	20.000	200.000	10.000	230.000	5.000	250.000	-35.000	329.000	-53.000	350.000
GR	-72.000	372.000	-68.000	393.000	-65.000	422.000	-65.000	443.000	-61.000	465.000
GR	-50.000	479.000	-41.000	501.000	-28.000	530.000	-12.000	544.000	-7.000	565.000
GR	-8.000	580.000	5.000	680.000	10.000	690.000	20.000	720.000	24.000	735.000
GR	26.000	746.000	28.000	773.000	30.000	805.000	32.000	850.000	32.000	960.000
GR	40.000	1370.000	40.000	1320.000	46.000	1350.000	48.000	1380.000	50.000	1390.000

River Mile (RM)

RM 21.65 Data

X1	21.650	35.000	90.000	992.000	900.000	850.000	800.000	0.0	0.0	0.0
GR	60.000	0.0	50.000	30.000	40.000	90.000	30.000	97.000	20.000	110.000
GR	10.000	123.000	5.000	145.000	-6.000	178.000	-11.000	195.000	-23.000	228.000
GR	-33.000	262.000	-36.000	295.000	-32.000	312.000	-30.000	345.000	-32.000	378.000
GR	-34.000	412.000	-36.000	445.000	-38.000	478.000	-40.000	512.000	-35.000	528.000
GR	-19.000	562.000	-7.000	595.000	-8.000	628.000	-6.000	662.000	-6.000	678.000
GR	-8.000	712.000	-8.000	745.000	5.000	780.000	10.000	885.000	20.000	992.000
GR	30.000	1030.000	32.000	1055.000	40.000	1090.000	50.000	1260.000	60.000	1330.000

RM 21.80 Data

X1	21.800	37.000	190.000	1288.000	700.000	950.000	790.000	0.0	0.0	0.0
GR	80.000	0.0	70.000	25.000	60.000	120.000	50.000	137.000	40.000	190.000
GR	30.000	230.000	10.000	276.000	5.000	290.000	-7.000	357.000	-16.000	391.000
GR	-28.000	424.000	-51.000	458.000	-64.000	491.000	-70.000	508.000	-62.000	525.000
GR	-75.000	575.000	-96.000	592.000	-116.000	625.000	-116.000	659.000	-93.000	692.000
GR	-65.000	709.000	-35.000	742.000	-14.000	759.000	-10.000	792.000	5.000	810.000
GR	10.000	830.000	12.000	850.000	14.000	925.000	18.000	985.000	20.000	1037.000
GR	22.000	1050.000	30.000	1236.000	40.000	1288.000	42.000	1313.000	44.000	1340.000
GR	46.000	1600.000	50.000	1850.000	0.0	0.0	0.0	0.0	0.0	0.0

3720 EL OF	80.00	IS ABOVE MIN OF	-116.00,	BY	196.00	FT,SECNO=	21.800
3720 EL OF	70.00	IS ABOVE MIN OF	-116.00,	BY	186.00	FT,SECNC=	21.800
3720 EL OF	60.00	IS ABOVE MIN OF	-116.00,	BY	176.00	FT,SECNO=	21.800
3720 EL OF	50.00	IS ABOVE MIN CF	-116.00,	BY	166.00	FT,SECNO=	21.800
3720 EL OF	40.00	IS ABOVE MIN OF	-116.00,	BY	156.00	FT,SECNO=	21.800
3720 EL OF	40.00	IS ABOVE MIN CF	-116.00,	BY	156.00	FT,SECNC=	21.800
3720 EL OF	42.00	IS ABOVE MIN OF	-116.00,	BY	158.00	FT,SECNO=	21.800
3720 EL OF	44.00	IS ABOVE MIN OF	-116.00,	BY	160.00	FT,SECNO=	21.800
3720 EL OF	46.00	IS ABOVE MIN OF	-116.00,	BY	162.00	FT,SECNC=	21.800
3720 EL OF	50.00	IS ABOVE MIN CF	-116.00,	BY	166.00	FT,SECNC=	21.800

Manning's n = 0.01 for overbanks and 0.07 for channel. contraction coeff. 0.0 and expansion coeff 0.0. Typical 0.1 and 0.3 contraction and expansion coeff. were used in the duplicate model

NC	0.0	0.0	0.070	0.0	0.0	0.0	0.0	0.0	0.0	0.0
X1	22.150	36.000	190.000	1270.000	2000.000	1600.000	1900.000	0.0	0.0	0.0
GR	60.000	0.0	50.000	20.000	40.000	80.000	40.000	190.000	30.000	240.000
GR	20.000	250.000	10.000	265.000	5.000	270.000	-12.000	446.000	-16.000	481.000
GR	-21.000	516.000	-34.000	534.000	-47.000	569.000	-61.000	614.000	-71.000	640.000
GR	-69.000	657.000	-61.000	675.000	-57.000	710.000	-52.000	745.000	-44.000	780.000
GR	-35.000	816.000	-17.000	833.000	-10.000	851.000	-9.000	886.000	-8.000	921.000
GR	-14.000	939.000	-19.000	974.000	-15.000	1009.000	-2.000	1045.000	5.000	1115.000
GR	10.000	1125.000	20.000	1200.000	30.000	1240.000	40.000	1270.000	50.000	1560.000
GR	60.000	1990.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

RM 21.80 Data

X1	22.250	31.000	390.000	1130.000	400.000	500.000	500.000	0.0	0.0	0.0
GR	60.000	0.0	50.000	20.000	40.000	390.000	30.000	420.000	20.000	430.000
GR	10.000	440.000	5.000	450.000	-5.000	513.000	-12.000	529.000	-34.000	561.000
GR	-46.000	592.000	-55.000	608.000	-64.000	640.000	-75.000	672.000	-81.000	687.000
GR	-74.000	719.000	-57.000	735.000	-42.000	767.000	-16.000	798.000	-12.000	814.000
GR	-14.000	846.000	-14.000	909.000	-12.000	941.000	-4.000	972.000	5.000	1020.000
GR	10.000	1035.000	20.000	1070.000	30.000	1090.000	40.000	1130.000	50.000	1415.000

RM 22.25 Data

GR 60.000 1990.000 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

X1	22.250	31.000	390.000	1130.000	400	500.000	500.000	0.0	0.0	0.0
GR	60.000	0.0	50.000	20.000	40.000	390.000	30.000	420.000	20.000	430.000
GR	10.000	440.000	5.000	450.000	-5.000	513.000	-12.000	529.000	-34.000	561.000
GR	-46.000	592.000	-55.000	608.000	-64.000	640.000	-75.000	672.000	-81.000	687.000
GR	-74.000	719.000	-57.000	735.000	-42.000	767.000	-16.000	798.000	-12.000	814.000
GR	-14.000	846.000	-14.000	909.000	-12.000	941.000	-4.000	972.000	5.000	1020.000
GR	10.000	1035.000	20.000	1070.000	30.000	1090.000	40.000	1130.000	50.000	1415.000
GR	60.000	1900.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Repeat RM 22.25 Data

X1	22.300	39.000	800.000	1220.000	270.000	250.000	260.000	0.0	0.0	0.0
GR	47.000	430.000	47.000	650.000	40.000	680.000	30.000	720.000	10.000	800.000
GR	-6.000	810.000	-8.000	820.000	-13.000	830.000	-18.000	850.000	-30.000	860.000
GR	-40.000	870.000	-51.000	880.000	-58.000	900.000	-65.000	920.000	-71.000	940.000
GR	-80.000	960.000	-96.000	980.000	-100.000	1000.000	-102.000	1030.000	-100.000	1060.000
GR	-94.000	1080.000	-86.000	1090.000	-76.000	1100.000	-67.000	1110.000	-60.000	1130.000
GR	-54.000	1150.000	-45.000	1160.000	-30.000	1170.000	-11.000	1180.000	-6.000	1200.000
GR	10.000	1220.000	13.000	1240.000	18.000	1250.000	20.000	1300.000	24.000	1330.000
GR	30.000	1380.000	40.000	1450.000	44.000	1500.000	47.000	1600.000	0.0	0.0

RM 22.30 Data

EJ 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

Manning's  $n = 0.07$  for overbanks and  $0.032$  for channel. contraction coeff.  $0.1$  and expansion coeff.  $0.3$

Flow regimes match the one listed above. Only 4 flow regimes were used the last one listed was omitted

T1 10 YEAR FLOOD  
 T2 BLW CLKMS R TO WILL FALLS  
 T3 WILLAMETTE R WEST LINN OR

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	RVINS	C	WSEL	EQ
-1.	2.	0.	C.	0.0	0.0	-1.0	0.	30.810	C.0	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FA	ALLCC	IPW	CENIM	ITRACE
1.000	0.0	-1.000	C.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
J3	1.000	26.000	14.000	17.000	4.000	27.000	28.000	21.000	22.000	C.C
J3	VAR(I),I=1,10									
	1.	26.	14.	17.	4.	27.	28.	21.	22.	C.C
NC	0.070	C.070	C.032	0.100	0.300	0.0	0.0	0.0	C.C	C.C
CT	5.000	251000.000	329000.000	375000.000	495000.000	435000.000	0.0	0.0	C.C	C.C
X1	22.350	27.000	410.000	800.000	0.0	0.0	0.0	C.C	C.C	C.C
GR	50.000	C.0	40.000	135.000	30.000	192.000	20.000	320.000	10.000	380.000
GR	3.000	410.000	-15.000	430.000	-20.000	450.000	-53.000	470.000	-59.000	500.000
GR	67.000	520.000	-75.000	550.000	-101.000	600.000	-103.000	620.000	-101.000	650.000
GR	94.000	680.000	-67.000	710.000	-55.000	740.000	-42.000	755.000	-31.000	770.000
GR	12.000	785.000	-7.000	800.000	10.000	820.000	20.000	850.000	30.000	900.000
GR	40.000	930.000	50.000	1190.000	0.0	0.0	0.0	C.C	C.C	C.C
X1	23.100	20.000	800.000	1880.000	3700.000	4200.000	4000.000	0.0	0.0	0.0
GR	50.000	0.0	43.500	215.000	40.000	475.000	20.000	530.000	10.000	600.000
GR	2.000	900.000	-8.000	950.000	-11.000	1000.000	-9.000	1050.000	-10.000	1300.000
GR	17.000	1400.000	-26.000	1500.000	-19.000	1600.000	-14.000	1700.000	-10.000	1800.000
GR	10.000	1880.000	20.000	1945.000	30.000	2000.000	40.000	2045.000	50.000	2200.000
X1	23.790	25.000	300.000	950.000	3300.000	3500.000	3400.000	0.0	0.0	0.0
GR	50.000	0.0	40.000	35.000	30.000	80.000	20.000	140.000	10.000	260.000
GR	4.000	300.000	-9.000	350.000	-21.000	400.000	-23.000	500.000	-34.000	560.000
GR	40.000	600.000	-47.000	630.000	-52.000	700.000	-46.000	770.000	-40.000	800.000
GR	30.000	850.000	-18.000	880.000	-9.000	900.000	-6.000	950.000	4.000	1000.000
GR	10.000	1010.000	20.000	1035.000	40.000	1060.000	48.000	1115.000	48.000	1220.000
NC	0.070	C.060	C.032	0.100	0.300	0.0	0.0	C.C	C.C	C.C
X1	24.060	23.000	260.000	1360.000	1500.000	1300.000	1400.000	0.0	0.0	0.0
GR	50.000	0.0	20.000	30.000	10.000	70.000	10.000	260.000	4.000	300.000
GR	13.000	330.000	-25.000	390.000	-11.000	500.000	-3.000	600.000	-8.000	700.000
GR	0.0	800.000	0.0	900.000	8.000	970.000	10.000	1120.000	12.000	1150.000
GR	12.000	1200.000	14.000	1240.000	18.000	1270.000	18.000	1315.000	16.000	1360.000
GR	10.000	1520.000	40.000	1640.000	47.000	1790.000	0.0	C.C	C.C	C.C
NC	0.060	0.060	0.038	0.100	0.300	0.0	0.0	C.C	C.C	C.C
X1	24.500	25.000	400.000	1350.000	2500.000	1900.000	2200.000	C.C	C.C	C.C
GR	50.000	0.0	40.000	40.000	30.000	75.000	20.000	270.000	12.000	310.000
GR	8.000	350.000	-8.000	400.000	-6.000	500.000	0.0	560.000	2.000	600.000
GR	7.000	700.000	-7.000	800.000	-5.000	900.000	-3.000	1000.000	-2.000	1100.000
GR	3.000	1200.000	-2.000	1300.000	3.000	1350.000	10.000	1400.000	20.000	1430.000
GR	30.000	1480.000	40.000	1570.000	40.000	1750.000	38.000	1900.000	36.000	2030.000
NC	0.060	0.060	C.040	0.100	0.300	0.0	0.0	C.C	C.C	C.C
X1	24.900	23.000	550.000	1250.000	1900.000	2100.000	2000.000	0.0	0.0	0.0

RM 22.25 Data

RM 23.10 Data

## Appendix C:

- HEC-RAS Standard Results Tables
- HEC-RAS Proposed Model Cross Sections
- HEC-RAS Project Location Cross-Section
- HEC-RAS Proposed Model Profile

HEC-RAS Plan: Duplicate Conditions River: Willamette River Reach: 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	23.1	10 yr	251000.00	-26.00	33.03	-0.11	33.43	0.000081	5.15	53910.52	1519.48	0.14
1	23.1	50 yr	329000.00	-26.00	40.80	2.61	41.27	0.000078	5.65	65928.23	1651.55	0.14
1	23.1	100 yr	375000.00	-26.00	44.59	4.15	45.12	0.000079	5.96	71888.66	1950.20	0.14
1	23.1	500 yr	495000.00	-26.00	53.24	7.79	53.90	0.000082	6.70	85465.04	2200.00	0.15
1	22.35	10 yr	251000.00	-103.00	32.45	-50.38	33.12	0.000057	6.62	41653.67	730.83	0.12
1	22.35	50 yr	329000.00	-103.00	39.95	-44.21	40.91	0.000075	7.95	47118.16	794.58	0.14
1	22.35	100 yr	375000.00	-103.00	43.58	-40.85	44.72	0.000086	8.69	49803.73	936.38	0.15
1	22.35	500 yr	495000.00	-103.00	51.77	-32.76	53.40	0.000113	10.49	55864.07	1190.00	0.17
1	22.3	10 yr	251000.00	-102.00	32.43	-50.46	33.09	0.000296	6.56	38666.48	686.68	0.12
1	22.3	50 yr	329000.00	-102.00	39.90	-44.22	40.87	0.000389	7.93	42028.23	768.86	0.14
1	22.3	100 yr	375000.00	-102.00	43.50	-40.86	44.67	0.000447	8.71	43649.18	828.72	0.15
1	22.3	500 yr	495000.00	-102.00	51.59	-32.84	53.33	0.000600	10.63	47291.77	1170.00	0.18
1	22.25	10 yr	251000.00	-81.00	32.25	-23.92	32.98	0.000587	6.90	36400.38	685.72	0.17
1	22.25	50 yr	329000.00	-81.00	39.77	-16.87	40.74	0.000702	7.88	41761.16	738.42	0.18
1	22.25	100 yr	375000.00	-81.00	43.40	-9.02	44.51	0.000743	8.44	44446.25	962.86	0.19
1	22.25	500 yr	495000.00	-81.00	51.59	-2.11	53.08	0.000845	9.80	50505.05	1489.60	0.21
1	22.15	10 yr	251000.00	-71.00	32.27	-23.73	32.66	0.000335	5.05	49708.67	1018.14	0.13
1	22.15	50 yr	329000.00	-71.00	39.84	-15.77	40.35	0.000379	5.71	57650.68	1078.74	0.14
1	22.15	100 yr	375000.00	-71.00	43.51	-11.91	44.09	0.000395	6.09	61610.75	1312.83	0.14
1	22.15	500 yr	495000.00	-71.00	51.80	-4.53	52.57	0.000438	7.01	70568.33	1621.16	0.15
1	21.8	10 yr	251000.00	-116.00	31.68	-49.36	32.11	0.000356	5.25	47836.73	1021.46	0.14
1	21.8	50 yr	329000.00	-116.00	39.18	-42.93	39.72	0.000398	5.90	55759.23	1090.49	0.15
1	21.8	100 yr	375000.00	-116.00	42.82	-39.46	43.43	0.000414	6.28	59752.13	1149.06	0.15
1	21.8	500 yr	495000.00	-116.00	51.05	-31.29	51.85	0.000451	7.20	68783.98	1464.78	0.16
1	21.65	10 yr	251000.00	-40.00	30.96	-4.86	31.61	0.000542	6.46	38875.52	945.67	0.17
1	21.65	50 yr	329000.00	-40.00	38.36	-0.98	39.17	0.000558	7.23	45522.66	991.68	0.18
1	21.65	100 yr	375000.00	-40.00	41.93	1.09	42.85	0.000579	7.69	48741.86	1044.39	0.18
1	21.65	500 yr	495000.00	-40.00	49.97	5.85	51.18	0.000635	8.84	55993.95	1229.31	0.20

HEC-RAS Plan: Corrected Effective River: Willamette River Reach: 1

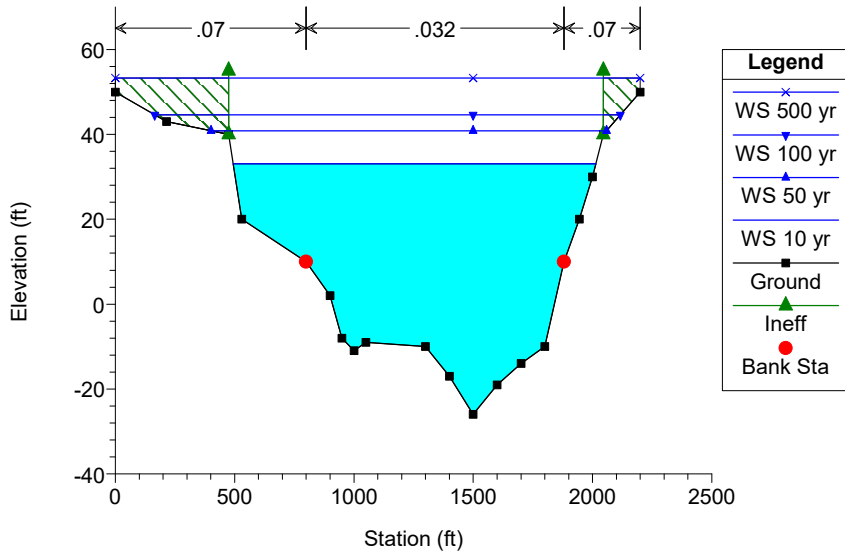
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	23.1	10 yr	251000.00	-26.00	33.09	-0.11	33.49	0.000080	5.15	53995.38	1519.88	0.14
1	23.1	50 yr	329000.00	-26.00	40.85	2.61	41.33	0.000078	5.65	66011.20	1656.95	0.14
1	23.1	100 yr	375000.00	-26.00	44.65	4.15	45.17	0.000078	5.95	71969.73	1952.58	0.14
1	23.1	500 yr	495000.00	-26.00	53.30	7.79	53.96	0.000082	6.69	85561.51	2200.00	0.15
1	22.56	10 yr	251000.00	-69.92	32.52	-34.75	33.26	0.000078	7.00	41418.42	1003.68	0.14
1	22.56	50 yr	329000.00	-69.92	40.08	-29.05	41.07	0.000095	8.19	48688.27	1100.92	0.16
1	22.56	100 yr	375000.00	-69.92	43.74	-25.97	44.89	0.000105	8.86	52315.27	1148.20	0.17
1	22.56	500 yr	495000.00	-69.92	52.06	-18.31	53.63	0.000130	10.44	60740.45	1330.04	0.19
1	22.55	10 yr	251000.00	-70.92	32.52	-34.85	33.26	0.000078	6.99	41440.64	1003.61	0.14
1	22.55	50 yr	329000.00	-70.92	40.07	-29.14	41.06	0.000095	8.18	48709.55	1100.86	0.16
1	22.55	100 yr	375000.00	-70.92	43.73	-26.05	44.89	0.000105	8.86	52335.89	1148.17	0.17
1	22.55	500 yr	495000.00	-70.92	52.06	-18.40	53.62	0.000130	10.43	60759.72	1329.97	0.19
1	22.35	10 yr	251000.00	-103.00	32.45	-50.38	33.12	0.000057	6.62	41653.67	730.83	0.12
1	22.35	50 yr	329000.00	-103.00	39.95	-44.21	40.91	0.000075	7.95	47118.16	794.58	0.14
1	22.35	100 yr	375000.00	-103.00	43.58	-40.85	44.72	0.000086	8.69	49803.73	936.38	0.15
1	22.35	500 yr	495000.00	-103.00	51.77	-32.76	53.40	0.000113	10.49	55864.07	1190.00	0.17
1	22.3	10 yr	251000.00	-102.00	32.43	-50.46	33.09	0.000296	6.56	38666.48	686.68	0.12
1	22.3	50 yr	329000.00	-102.00	39.90	-44.22	40.87	0.000389	7.93	42028.23	768.86	0.14
1	22.3	100 yr	375000.00	-102.00	43.50	-40.86	44.67	0.000447	8.71	43649.18	828.72	0.15
1	22.3	500 yr	495000.00	-102.00	51.59	-32.84	53.33	0.000600	10.63	47291.77	1170.00	0.18
1	22.25	10 yr	251000.00	-81.00	32.25	-23.92	32.98	0.000587	6.90	36400.38	685.72	0.17
1	22.25	50 yr	329000.00	-81.00	39.77	-16.87	40.74	0.000702	7.88	41761.16	738.42	0.18
1	22.25	100 yr	375000.00	-81.00	43.40	-9.02	44.51	0.000743	8.44	44446.25	962.86	0.19
1	22.25	500 yr	495000.00	-81.00	51.59	-2.11	53.08	0.000845	9.80	50505.05	1489.60	0.21
1	22.15	10 yr	251000.00	-71.00	32.27	-23.73	32.66	0.000335	5.05	49708.67	1018.14	0.13
1	22.15	50 yr	329000.00	-71.00	39.84	-15.77	40.35	0.000379	5.71	57650.68	1078.74	0.14
1	22.15	100 yr	375000.00	-71.00	43.51	-11.91	44.09	0.000395	6.09	61610.75	1312.83	0.14
1	22.15	500 yr	495000.00	-71.00	51.80	-4.53	52.57	0.000438	7.01	70568.33	1621.16	0.15
1	21.8	10 yr	251000.00	-116.00	31.68	-49.36	32.11	0.000356	5.25	47836.73	1021.46	0.14
1	21.8	50 yr	329000.00	-116.00	39.18	-42.93	39.72	0.000398	5.90	55759.23	1090.49	0.15
1	21.8	100 yr	375000.00	-116.00	42.82	-39.46	43.43	0.000414	6.28	59752.13	1149.06	0.15
1	21.8	500 yr	495000.00	-116.00	51.05	-31.29	51.85	0.000451	7.20	68783.98	1464.78	0.16
1	21.65	10 yr	251000.00	-40.00	30.96	-4.86	31.61	0.000542	6.46	38875.52	945.67	0.17
1	21.65	50 yr	329000.00	-40.00	38.36	-0.98	39.17	0.000558	7.23	45522.66	991.68	0.18
1	21.65	100 yr	375000.00	-40.00	41.93	1.09	42.85	0.000579	7.69	48741.86	1044.39	0.18
1	21.65	500 yr	495000.00	-40.00	49.97	5.85	51.18	0.000635	8.84	55993.95	1229.31	0.20

HEC-RAS Plan: Proposed River: Willamette River Reach: 1

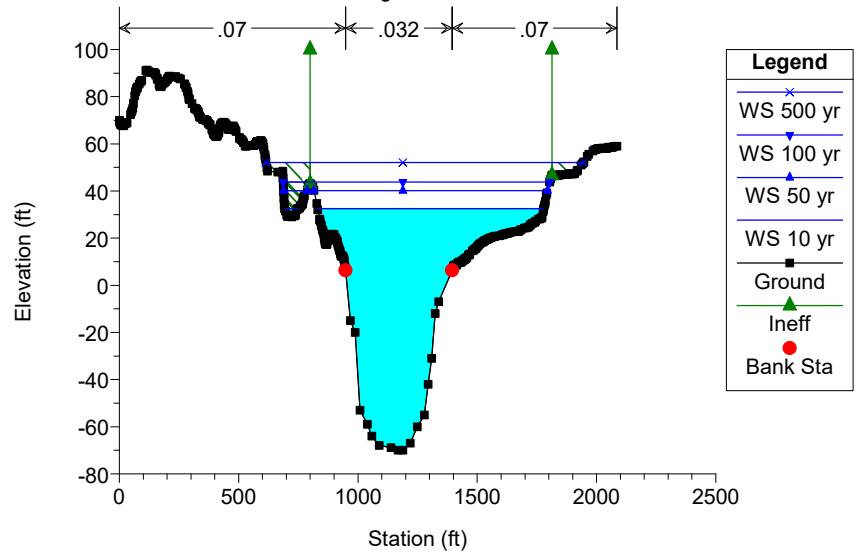
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	23.1	10 yr	251000.00	-26.00	33.09	-0.11	33.49	0.000080	5.15	53995.38	1519.88	0.14
1	23.1	50 yr	329000.00	-26.00	40.85	2.61	41.33	0.000078	5.65	66011.20	1656.95	0.14
1	23.1	100 yr	375000.00	-26.00	44.65	4.15	45.17	0.000078	5.95	71969.73	1952.58	0.14
1	23.1	500 yr	495000.00	-26.00	53.30	7.79	53.96	0.000082	6.69	85561.51	2200.00	0.15
1	22.56	10 yr	251000.00	-69.92	32.52	-34.75	33.26	0.000078	7.00	41418.42	1003.52	0.14
1	22.56	50 yr	329000.00	-69.92	40.08	-29.05	41.07	0.000095	8.19	48688.27	1076.78	0.16
1	22.56	100 yr	375000.00	-69.92	43.74	-25.97	44.89	0.000105	8.86	52315.27	1116.95	0.17
1	22.56	500 yr	495000.00	-69.92	52.06	-18.31	53.63	0.000130	10.44	60740.45	1330.04	0.19
1	22.55	10 yr	251000.00	-70.92	32.52	-34.85	33.26	0.000078	6.99	41440.64	1003.46	0.14
1	22.55	50 yr	329000.00	-70.92	40.07	-29.14	41.06	0.000095	8.18	48709.55	1076.73	0.16
1	22.55	100 yr	375000.00	-70.92	43.73	-26.05	44.89	0.000105	8.86	52335.89	1116.93	0.17
1	22.55	500 yr	495000.00	-70.92	52.06	-18.40	53.62	0.000130	10.43	60759.72	1329.97	0.19
1	22.35	10 yr	251000.00	-103.00	32.45	-50.38	33.12	0.000057	6.62	41653.67	730.83	0.12
1	22.35	50 yr	329000.00	-103.00	39.95	-44.21	40.91	0.000075	7.95	47118.16	794.58	0.14
1	22.35	100 yr	375000.00	-103.00	43.58	-40.85	44.72	0.000086	8.69	49803.73	936.38	0.15
1	22.35	500 yr	495000.00	-103.00	51.77	-32.76	53.40	0.000113	10.49	55864.07	1190.00	0.17
1	22.3	10 yr	251000.00	-102.00	32.43	-50.46	33.09	0.000296	6.56	38666.48	686.68	0.12
1	22.3	50 yr	329000.00	-102.00	39.90	-44.22	40.87	0.000389	7.93	42028.23	768.86	0.14
1	22.3	100 yr	375000.00	-102.00	43.50	-40.86	44.67	0.000447	8.71	43649.18	828.72	0.15
1	22.3	500 yr	495000.00	-102.00	51.59	-32.84	53.33	0.000600	10.63	47291.77	1170.00	0.18
1	22.25	10 yr	251000.00	-81.00	32.25	-23.92	32.98	0.000587	6.90	36400.38	685.72	0.17
1	22.25	50 yr	329000.00	-81.00	39.77	-16.87	40.74	0.000702	7.88	41761.16	738.42	0.18
1	22.25	100 yr	375000.00	-81.00	43.40	-9.02	44.51	0.000743	8.44	44446.25	962.86	0.19
1	22.25	500 yr	495000.00	-81.00	51.59	-2.11	53.08	0.000845	9.80	50505.05	1489.60	0.21
1	22.15	10 yr	251000.00	-71.00	32.27	-23.73	32.66	0.000335	5.05	49708.67	1018.14	0.13
1	22.15	50 yr	329000.00	-71.00	39.84	-15.77	40.35	0.000379	5.71	57650.68	1078.74	0.14
1	22.15	100 yr	375000.00	-71.00	43.51	-11.91	44.09	0.000395	6.09	61610.75	1312.83	0.14
1	22.15	500 yr	495000.00	-71.00	51.80	-4.53	52.57	0.000438	7.01	70568.33	1621.16	0.15
1	21.8	10 yr	251000.00	-116.00	31.68	-49.36	32.11	0.000356	5.25	47836.73	1021.46	0.14
1	21.8	50 yr	329000.00	-116.00	39.18	-42.93	39.72	0.000398	5.90	55759.23	1090.49	0.15
1	21.8	100 yr	375000.00	-116.00	42.82	-39.46	43.43	0.000414	6.28	59752.13	1149.06	0.15
1	21.8	500 yr	495000.00	-116.00	51.05	-31.29	51.85	0.000451	7.20	68783.98	1464.78	0.16
1	21.65	10 yr	251000.00	-40.00	30.96	-4.86	31.61	0.000542	6.46	38875.52	945.67	0.17
1	21.65	50 yr	329000.00	-40.00	38.36	-0.98	39.17	0.000558	7.23	45522.66	991.68	0.18
1	21.65	100 yr	375000.00	-40.00	41.93	1.09	42.85	0.000579	7.69	48741.86	1044.39	0.18
1	21.65	500 yr	495000.00	-40.00	49.97	5.85	51.18	0.000635	8.84	55993.95	1229.31	0.20



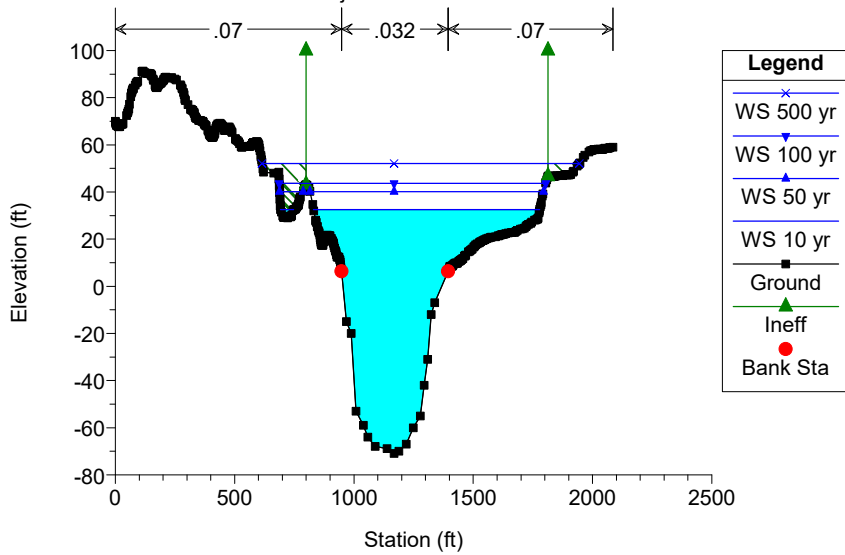
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RM 23.10



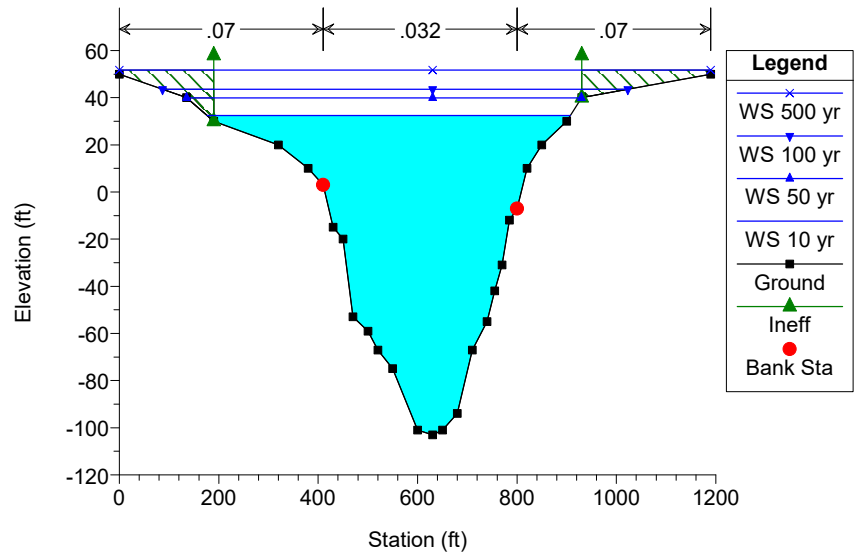
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Wall Length 56 feet RM 22.56



CARO4021\_Model Plan: Proposed Model 7/20/2023  
Project Location RM 22.55

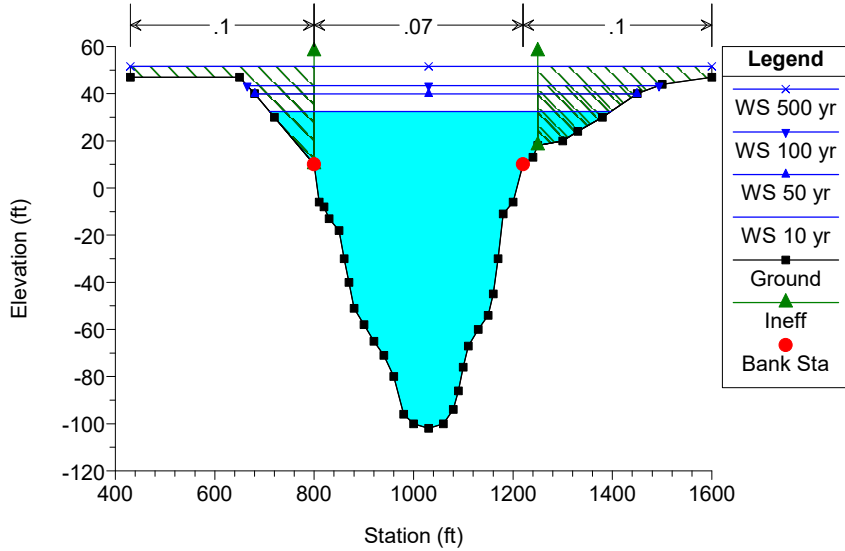


CARO4021\_Model Plan: Proposed Model 7/20/2023  
RM 22.35



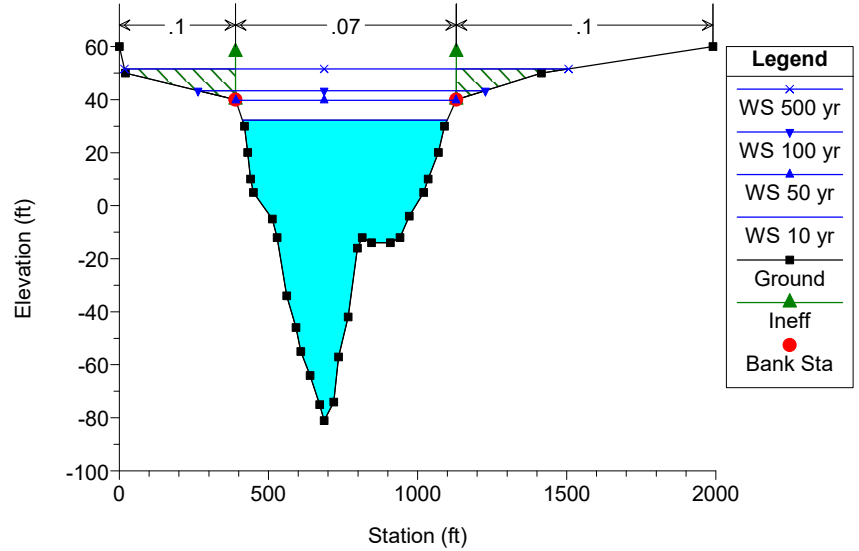
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RM 22.30



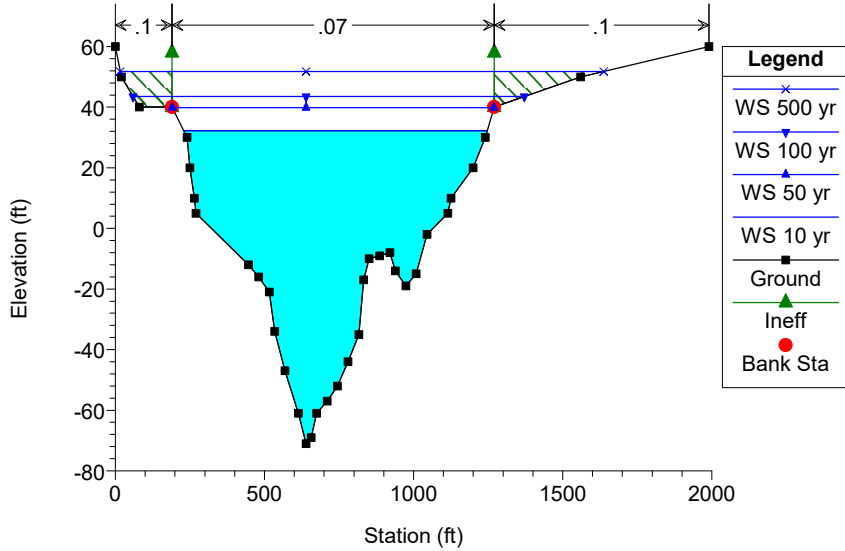
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RM 22.25



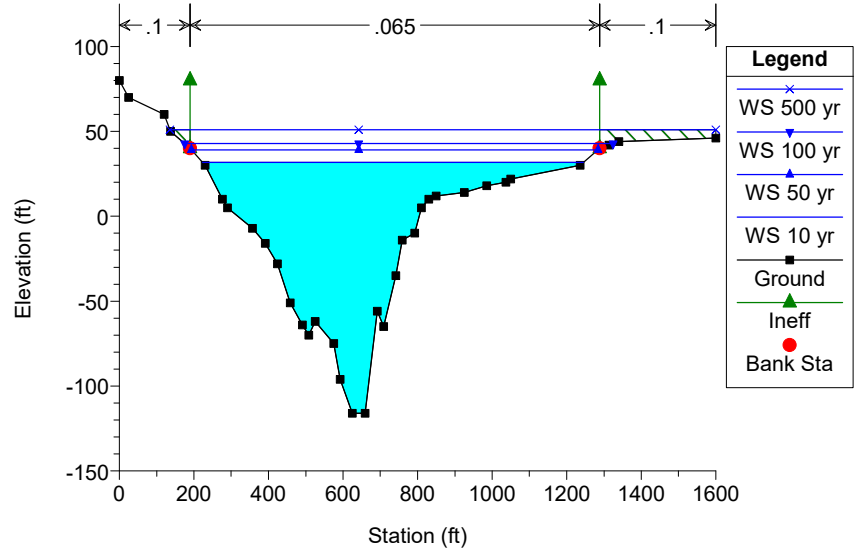
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RM 22.15



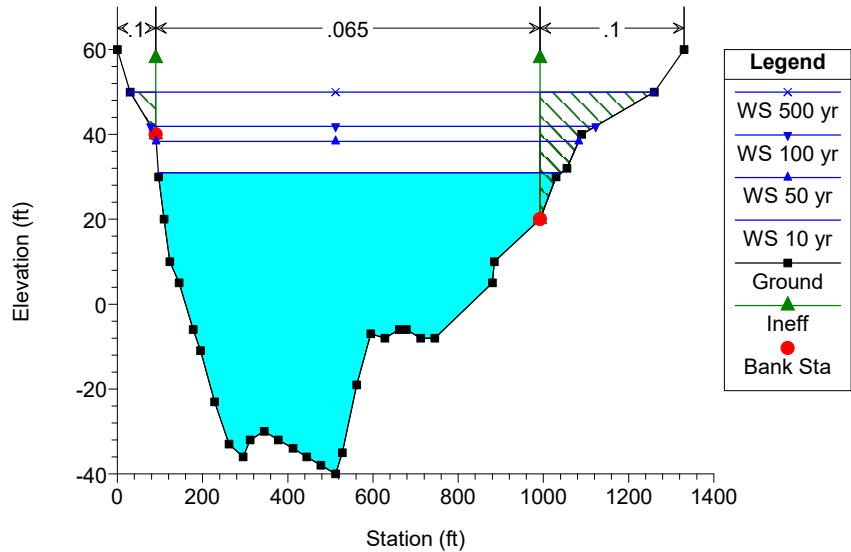
CARO4021\_Model Plan: Proposed Model 7/20/2023

RM 21.80



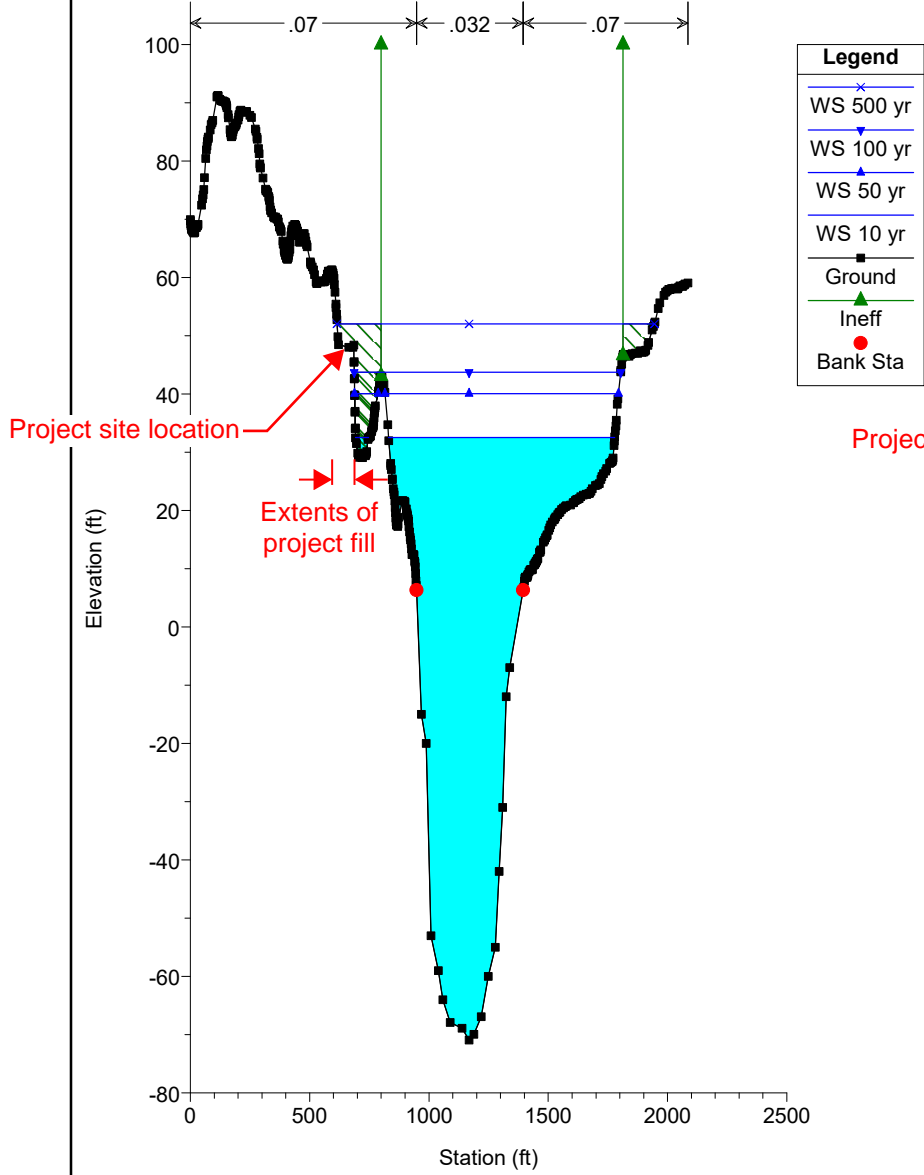
CARO4021\_Model Plan: Proposed Model 7/20/2023

RM 21.65



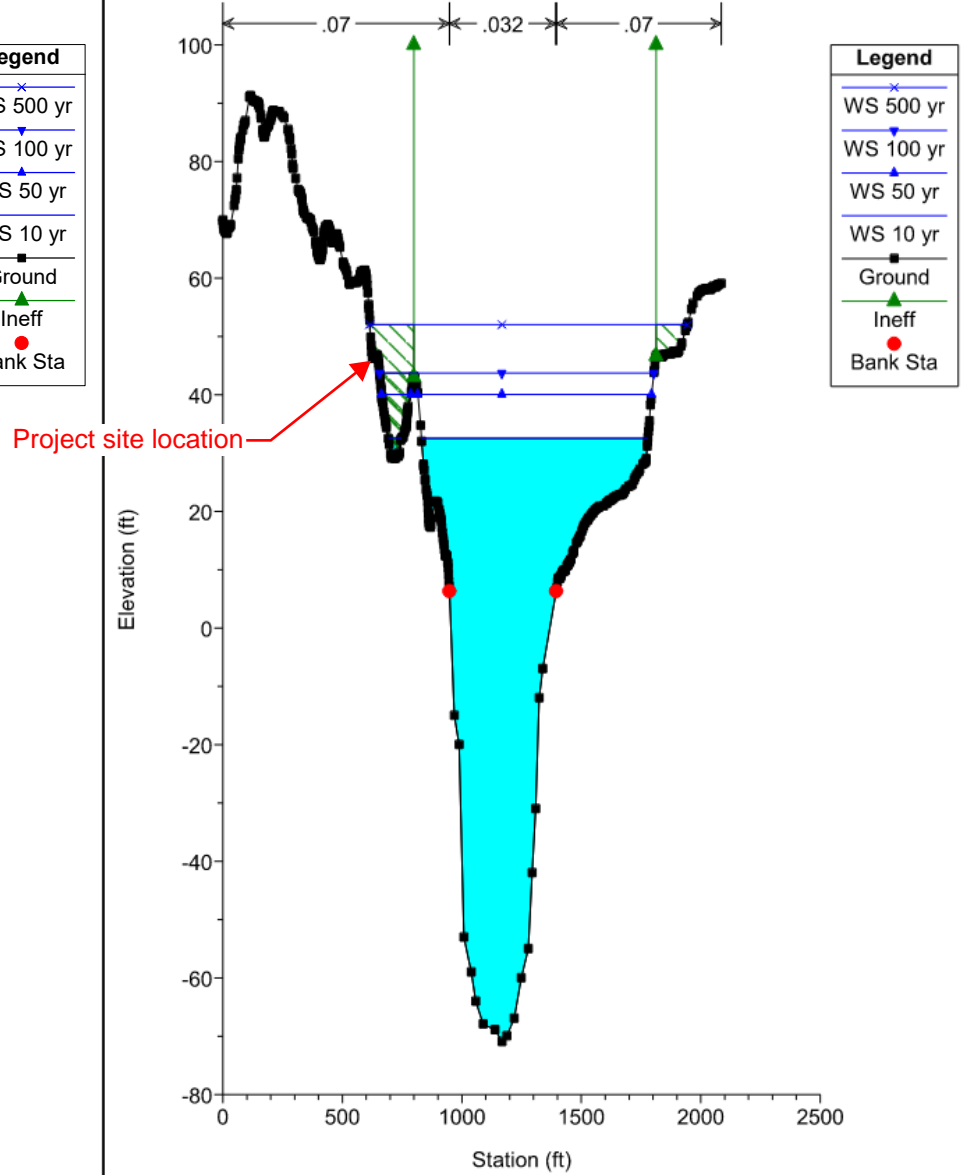
CARO4021\_Model Plan: Proposed Model 7/20/2023

Project Location RM 22.55



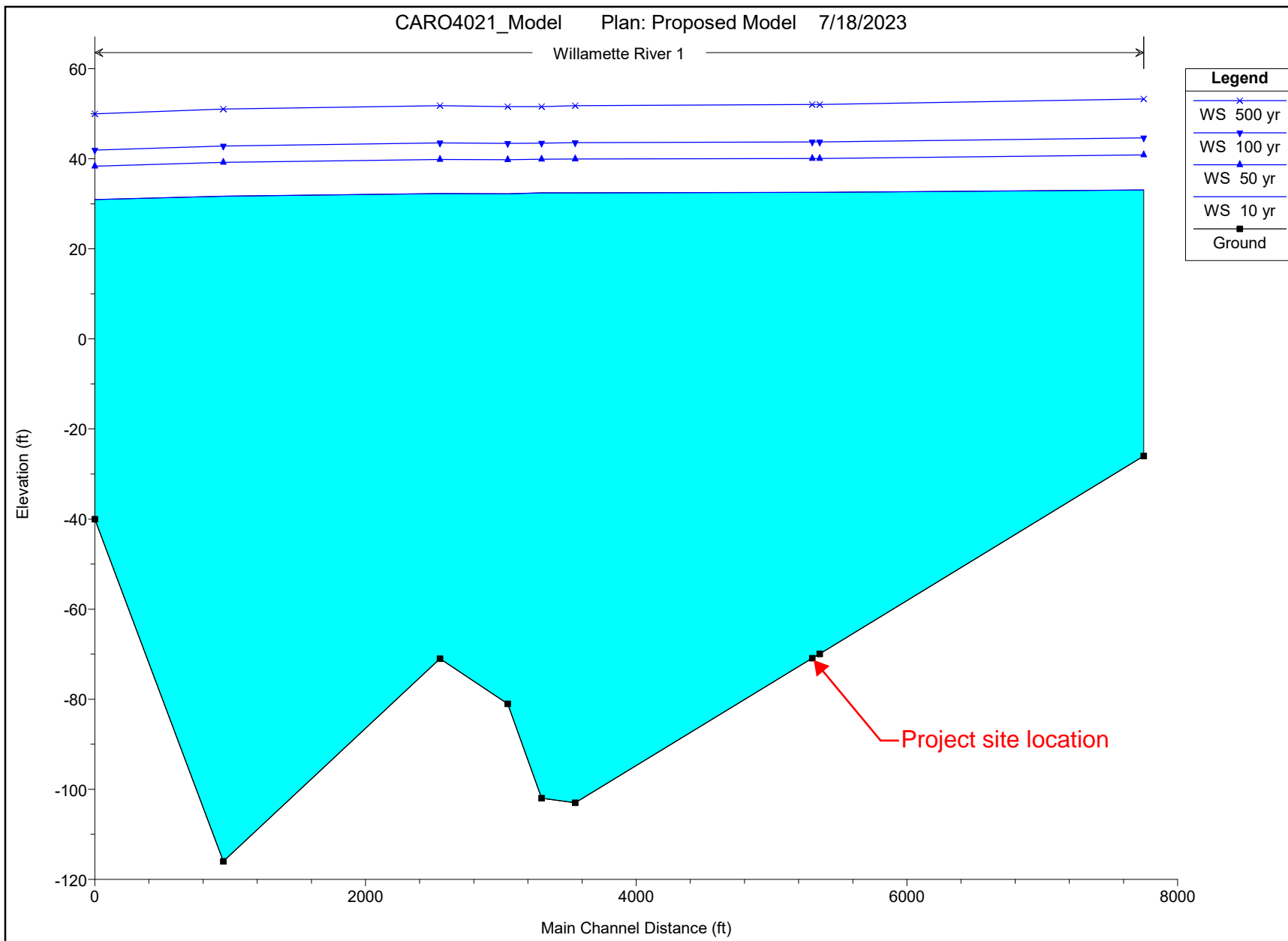
CARO4021\_Model Plan: Corrected Effective Model 7/20/2023

Project Location RM 22.55



West Linn Pump Station Replacement Project  
Willamette River Profile (River Mile 21.65 to River Mile 23.1)

CARO4021\_Model Plan: Proposed Model 7/18/2023



# Appendix F

## Floodplain Permit Response

## FLOODPLAIN DEVELOPMENT APPLICATION

For Office Use Only		
STAFF CONTACT	PERMIT NO.	PROJECT
NON-REFUNDABLE FEE(S)	REFUNDABLE DEPOSIT(S)	TOTAL

### Overview

In accordance with City of West Linn floodplain management regulations (West Linn Community Development Code Chapter 27), development within the West Linn regulatory floodplain must comply with the standards within Chapter 27. The regulatory floodplain is the Special Flood Hazard Area (SFHA) as defined on the currently effective Flood Insurance Rate Maps for West Linn and the area of inundation for the February 1996 flood.

### Before filling out this permit, complete the following checklist:

Location of Development:

1. Is the property that the proposed development activity will occur on at least partially within (horizontally within) the community's regulatory floodplain?
  - Yes
  - No, (If the answer is "No" then a floodplain development permit is NOT required)
  
2. Is the site where the proposed development activity will occur on the property at least partially within (horizontally within) the community's regulatory floodplain?
  - Yes
  - No, (If the answer is "No" then a floodplain development permit is NOT required)
  
3. Has FEMA, through a Letter of Map Change (LOMC) (i.e. LOMA, LOMR-F, LOMR), made a formal determination that this property or proposed development site is out of the regulatory floodplain?
  - Yes, (If the answer is "Yes" then a floodplain development permit is NOT required but a copy of the LOMC must be kept in the permitting records.)
  - No

## Section I: General Provisions

The undersigned hereby makes application for a permit to develop in a designated floodplain area. The work to be performed is described below and in attachments hereto. The undersigned agrees that all such work shall be done in accordance with the requirements of the City of West Linn and West Linn Community Development Code Chapters 27 and all other applicable local, state and federal regulations. This application does not create liability on the part of the City of West Linn or any officer or employee thereof for any flood damage that results from reliance on this application or administrative decision made lawfully hereunder.

1. When the community's floodplain regulatory standards apply to a proposed development activity, no work of any kind may begin in a regulatory floodplain area until a floodplain development permit is issued.
2. The permit may be revoked if any false statements are made herein. If revoked, all work must cease until a permit is re-issued.
3. The permit will expire if no work is commenced within 180 days of the date of issue.
4. The permit will not be issued until any other necessary local, state, or federal permits have been obtained (approved).

**Property Owner(s):\***

**Check box if Property Owner is Applicant**

**Applicant:**

\_\_\_\_\_  
Mailing Address:\_\_\_\_\_

\_\_\_\_\_  
Mailing Address:\_\_\_\_\_

\_\_\_\_\_  
Phone number:\_\_\_\_\_  
Fax number:\_\_\_\_\_  
Email:\_\_\_\_\_

\_\_\_\_\_  
Phone number:\_\_\_\_\_  
Fax number:\_\_\_\_\_  
Email:\_\_\_\_\_

*\*All property owners must be listed.*



## Section II: Development Proposal Information

### PROJECT LOCATION

Address of Property: 3821 Calaroga Drive, West Linn, OR 97068

Lot: 21E13CA01101 Subdivision: N/A Block: N/A

Township, Range, Section: N/A

(To avoid delay in processing the application, please provide enough information to easily identify the project location. A map or sketch attached to this application showing the project location is required.)

- the proposed development is NOT located horizontally within the Special Flood Hazard Area.\*
- the property is partially located horizontally within the Special Flood Hazard Area, but the proposed development activity site is NOT.\*

***\*If this box is checked then a floodplain development permit may not be required. Speak to community staff before completing the rest of this permit application.***

### PROJECT DESCRIPTION

#### A. Structural Development (*Check all that apply*)

##### Activity

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> New Structure                                 | <input type="checkbox"/> Residential: <input type="checkbox"/> Single, <input type="checkbox"/> Two-Family, or                           |
| <input checked="" type="checkbox"/> Addition*                                     | <input type="checkbox"/> Multi-Family (3+)   |
| <input checked="" type="checkbox"/> Alteration (includes repairs & improvements)* | <input checked="" type="checkbox"/> Non-Residential: <input checked="" type="checkbox"/> Elevated, <input type="checkbox"/> Floodproofed |
| <input checked="" type="checkbox"/> Relocation**                                  | <input type="checkbox"/> Combined Use (Residential and Non-Residential)  |
| <input checked="" type="checkbox"/> Demolition                                    | <input type="checkbox"/> Manufactured Home   |
| <input checked="" type="checkbox"/> Replacement                                   | <input type="checkbox"/> Recreational Vehicle (RV)   |
|   | <input type="checkbox"/> Garage: <input type="checkbox"/> Attached, <input type="checkbox"/> Detached                                    |
|   | <input type="checkbox"/> Appurtenant/Accessory Structure   |
|   | <input checked="" type="checkbox"/> Other (please specify): <u>Sewer Pump Station</u>  |

##### Structure Type

*\*An alternation includes the repair or improvement of a structure. If the value of an addition or alteration to a structure equals or exceeds 50% of the value of the structure before the addition or alteration, the entire structure must be treated a substantially improved structure.*

*\*\*A relocated structure must be treated as new construction.*

**B. Other Development (Check all that apply)**

- Clearing    Fill    Mining    Drilling    Grading    Dredging
- Excavation or Removal of Fill (Except for Structural Development Checked Above)
- Watercourse Alteration    Drainage Improvement (including culvert work)
- Individual water or Sewer System    Road, Street, or Bridge Construction
- Fencing    Utilities
- Subdivision (New Or Expansion), Partition, Master Plan, or Planned Unit Developments
- Other (Please Specify): \_\_\_\_\_

**FLOOD HAZARD INFORMATION**

1. The proposed development is located on FIRM Panel: 41005C0019D (number and suffix), Dated: June 17, 2008
2. The proposed development is located partially or fully within the horizontal boundaries of the Special Flood Hazard Area, Zone(s): Zone AE (A, A1 -30, AE, AO, AH, AR, A99, V, V1-30, or VE)
3. The one-percent-annual chance (100 year) flood elevation at this site is: 44 ft  
NGVD 29 / NAVD 88 (circle the correct datum),  
source: FIRM  None Available
4. Is the proposed development located partially or fully within a designated Floodway:  Yes    No  
If "Yes", then is this proposal for:  
Temporary encroachment (less than 30 days – outside of flood season (November – March)  
Fish habitat restoration or enhancement\*  
Fence (type and material: NA)  
*\*For habitat restoration projects a rise in elevation may be allowed if a CLOMR is approved by FEMA. Permit shall not be issued, until FEMA approval is received.*
5. If "Yes" was answered to (4.) above, then is a "No Rise Certification" with supporting engineering hydrologic and hydraulic data attached?    Yes    No
6. Are other federal, state, or local permits required?    Yes    No  
If yes, which ones: DEQ 1200-C

**Section III. Additional Information Required (Complete all that apply)**

**1. Complete for Proposed Structures and Building Sites:**

- A. Base Flood Elevation at this site: 44.0 ft (NGVD 29/NAVD 88).
- B. Elevation of highest adjacent grade: 47.3 ft (NGVD 29/NAVD 88).
- C. Required Elevation of lowest floor\* (including basement): 7.83 ft (NGVD 29/NAVD 88).
- D. Proposed Elevation of lowest floor\* (including basement): 7.83 ft (NGVD 29/NAVD 88).
- E. Elevation of next highest floor: 39.52 ft (NGVD 29/NAVD 88).
- F. Elevation of top of proposed garage slab, if any: NA ft (NGVD 29/NAVD 88).
- G. Details for anchoring structures (type of anchoring used and location of anchoring):  
\_\_\_\_\_  
\_\_\_\_\_

H. Details of floodproofing or elevation of utilities. Provide the elevation of the utilities or the elevation to which the utilities were floodproofed. If floodproofed, provide details regarding how the utilities were floodproofed (describe the type of floodproofing used or manner in which the utilities were floodproofed):  
\_\_\_\_\_  
\_\_\_\_\_

I. Exact location(s) on structure of all flood openings, if required. Include the elevation of the bottom of the flood opening(s), the size of the openings, and note if engineered flood opening(s) will be used. (Provide a reference diagram, in site plan or drawings):  
\_\_\_\_\_  
\_\_\_\_\_

J. Types of water-resistant materials used below the first-floor and portions of the structure they were applied to:  
\_\_\_\_\_  
\_\_\_\_\_

*\*lowest floor is defined as: the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure (such as a crawlspace), usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is built in compliance with the required floodplain and building code regulations including but not limited to flood venting requirements.*

**2. Complete for Alterations or Additions to Existing Structures:**

Please complete **Appendix A** of the West Linn floodplain development permit and enter the cost of the proposed construction\* here: \$ 1,874,087

**\*PLEASE NOTE:** Cost of construction estimates must include all structural elements, interior finish elements, utility and service equipment, labor and other costs associated with demolishing, removing, or altering building components, and construction management. As well as any improvements being made to repair damage that go beyond just making repairs to return to pre-damaged conditions.

**3. Complete for Non-Residential Floodproofed Construction:**

- A. Type of floodproofing method: Increase Elevation
- B. Required floodproofing elevation is: 44 feet NGVD.
- C. Floodproofing certification by a registered engineer attached?  
 Yes     No

**4. Complete For Partitions, Subdivisions, Master Plan, Or Planned Unit Developments:**

- A. Will the subdivision or other development contain 50 lots or 5 acres?  
 Yes     No
- B. If “Yes”, does the plat or proposal clearly identify base flood elevations?  
 Yes     No
- C. Are the 100 year Floodplain and Floodway delineated on the site plan?  
 Yes     No

**5. Complete for Proposals NOT Included in 1-4 Above:**

- A. For all watercourse relocations and/or landform alterations include plans showing the proposed relocation and/or alterations. **NA**
- B. If the proposed development activity will result in a change in water elevation, then what is the change in water elevation (in feet) \_\_\_\_\_ increase/decrease (circle whichever applies). **NA**
- C. For stream habitat restoration that impacts a mapped floodway, provide copy of “no-rise certification” from registered professional engineer or a FEMA approved CLOMR. **NA**
- D. Amount of fill to be placed 265 cubic yards.
  - i. Top of new compacted fill elevation 47.5 ft.  
(NGVD29/NAVD 88)

**6. Required Attachments:**

- A. A site plan drawn to scale, with elevations of the project area and the nature, location, dimensions of existing and/or proposed structures, earthen fill placement, storage of materials or equipment and drainage facilities. Plans shall include location of all water bodies, adjacent roads, lot dimensions, as well as, delineation of Special Flood Hazard Areas, regulatory Floodway boundaries including Base Flood Elevations (when available), or flood depth in AO zones.
- B. Copies of all required local, state, and federal permits. All required local, state, and federal permits must be approved before the floodplain development permit is approved.
- C. (OPTIONAL) A complete pre-construction Elevation Certificate signed and sealed by a registered professional surveyor.

- D. Certification from a registered professional engineer that any proposed non-residential floodproofed structure will meet the floodproofing criteria of CDC Chapters 27 and Oregon Specialty Code requirements, if applicable.
- E. Other documentation as required per the above sections.

**Section IV: Property Owner and Applicant Signatures**

I/We hereby request a Floodplain Development Permit on the above described real property, located within West Linn, Oregon. I/We hereby acknowledge that this application is not considered filed, until all of the required information has been submitted as determined by the floodplain administrator and all required fees have been paid in full.

**Property Owner(s)\***

Signature(s): \_\_\_\_\_,  
Name(s) (print): \_\_\_\_\_,  
Date: \_\_\_\_\_

**Tick box if the Property Owner is the Applicant.**

**Applicant**

Signature: \_\_\_\_\_  
Name (print): \_\_\_\_\_  
Date: \_\_\_\_\_

*This application is only for Floodplain Development Permit. Building Permits and any other permits require separate applications.*

*\*All property owners must sign. The signature is an acknowledgement and consent to this floodplain development permit application.*

---

**Section V: OFFICE USE ONLY**

**APPLICATION PROCESSING**

Date Application Received: \_\_\_\_\_ Initials: \_\_\_\_\_

Date Application Complete: \_\_\_\_\_ Initials: \_\_\_\_\_

Applicant Notified of Completeness: \_\_\_\_\_ Initials: \_\_\_\_\_

Fee Paid: \_\_\_\_\_ Receipt No. \_\_\_\_\_ Initials: \_\_\_\_\_

**SUBSTANTIAL IMPROVEMENT REVIEW**

The formula for substantial improvement threshold is as follows:

**Market Value X 50% (.50) = Substantial Improvement Threshold**

1. What is the market value (based on current Assessor data) of the existing structure prior to damage/improvement? \$ \_\_\_\_\_
2. What is 50% of the estimated market value of the existing structure prior to damage/improvement (use the formula provided above) \$ \_\_\_\_\_
3. Has Appendix A been completed?  
 **Yes**    **No**
4. Does the total cost of the proposed construction noted in Appendix A match the cost of the proposed construction provided in Section III.(2).(A.)?  
 **Yes**    **No**
5. What is the cost of the proposed construction\* (provided in both Section III.(2).(A.) and Appendix A)? \$ \_\_\_\_\_
6. Is the value listed in line "3." of this section, equal to or greater than the value listed in line "2."?  
 **Yes, (If "Yes", then the proposed development activity qualifies as a substantial improvement\*).**  
 **No**
7. Does the proposed development activity qualify as a substantial improvement\*?  
 **Yes**    **No**

*\*Construction cost estimates must include all structural elements, interior finish elements, utility and service equipment, labor and other costs associated with demolishing, removing, or altering building components, and construction management. As well as any improvements being made to repair damage that go beyond just making repairs to return to pre-damaged conditions.*

*\*\*If the cost of the proposed construction equals or exceeds 50 percent of the market value of the structure, then the entire structure must be treated as a substantially improved structure and the substantial improvement provisions shall apply. See FEMA publication [P-758, Substantial Improvement/Substantial Damage Desk Reference](#) for more information regarding substantial improvement.*



## **APPENDIX A**

To be completed for alterations, additions, rehabilitations, repairs, or improvements to existing structures.

### **Section I.**

#### **COSTS TO BE INCLUDED**

1. Material and labor for all structural elements, “including”:
  - ✓ Spread or continuous foundation footings and pilings
  - ✓ Monolithic or other types of concrete slabs
  - ✓ Bearing walls, tie beams and trusses
  - ✓ Floors and ceilings
  - ✓ Attached decks and porches
  - ✓ Interior partition walls
  - ✓ Exterior wall finishes (brick, stucco, siding) including painting and moldings
  - ✓ Windows and doors
  - ✓ Re-shingling or re-tiling a roof
  - ✓ Hardware
  
2. All interior finishing elements, “including”:
  - ✓ Tiling, linoleum, stone, or carpet over subflooring
  - ✓ Bathroom tiling and fixtures
  - ✓ Wall finishes (drywall, painting, stucco, plaster, paneling, marble, etc.)
  - ✓ Kitchen, utility and bathroom cabinets
  - ✓ Built-in bookcases, cabinets, and furniture
  - ✓ Hardware
  
3. All utility and service equipment, “including”:
  - ✓ HVAC equipment
  - ✓ Plumbing and electrical services
  - ✓ Light fixtures and ceiling fans
  - ✓ Security systems
  - ✓ Built-in kitchen appliances
  - ✓ Central vacuum systems
  - ✓ Water filtration, conditioning, or recirculation systems
  
4. Cost to demolish storm-damaged building components
  
5. Labor and other costs associated with moving or altering undamaged building components to accommodate the improvements or additions
  
6. Overhead and profits

#### **ITEMS TO BE EXCLUDED:**

1. Plans and specifications
2. Survey costs
3. Permit fees
4. Post-storm debris removal and clean up
5. Outside improvements, including:



- Landscaping
- Sidewalks
- Fences
- Swimming pools
- Screened pool enclosures
- Detached structures (including garages, sheds, and gazebos)
- Landscape irrigation systems

Source: FEMA Publication [P-758, Substantial Improvement/Substantial Damage Desk Reference](#)

## Section II.

### ITEMIZATION OF CONSTRUCTION COSTS TO COMPLETE PROJECT

	Work Description	Cost of Materials	Cost of Labor	Comments
1	Foundation/ Footings/ Pilings	\$98,297.33	\$163,828.28	
2	Concrete Slab	\$397,394.67	\$662,323.85	
3	Masonry Work	-	-	
4	Rough Carpentry	-	-	
5	Roofing and Gutters	-	-	
6	Insulation/ Weather Stripping	-	-	
7	Exterior Finish (stucco/ siding)	-	-	
8	Finished Carpentry	-	-	
9	Drywall	-	-	
10	Cabinets (built-in)	-	-	
11	Floor Covering	-	-	
12	Plumbing/ Gas	-	-	
13	Bathroom Fixtures	-	-	
14	Kitchen Fixtures	-	-	
15	Electrical and Lighting Fixtures	\$137,429.96	\$229,049.33	
16	Built-in Appliances	-	-	
17	HVAC System	-	-	
18	Paint and Wallpaper	-	-	
19	Demolition and Removal	\$104,770.98	\$419,083.68	
20	Overhead and Profit	\$19,989.99	\$399,799.81	
21	Construction Supervision	-	-	
	<b>GROSS TOTAL = Contract Price</b>	<b>\$757,883</b>	<b>\$1,116,204</b>	





**FEMA**

*NATIONAL FLOOD INSURANCE PROGRAM*

**ELEVATION CERTIFICATE**

**AND**

**INSTRUCTIONS**

# NATIONAL FLOOD INSURANCE PROGRAM ELEVATION CERTIFICATE

## PAPERWORK REDUCTION ACT NOTICE

Public reporting burden for the Elevation Certificate is estimated to average 3.5 hours per response. Burden means the time, effort, or financial resources expended by persons to generate, maintain, retain, disclose, or provide information to the Federal Emergency Management Agency (FEMA). You are not required to respond to the collection of information unless a valid OMB control number is displayed in the upper right corner of the form. You may send comments regarding the accuracy of the burden estimate and any suggestions for reducing the burden to: U.S. Department of Homeland Security, Federal Emergency Management Agency, Mitigation Division, 500 C Street SW, Washington DC 20472, Paperwork Reduction Project (1660-0008). **NOTE: Do not send your completed form to this address.** To obtain or retain benefits under the National Flood Insurance Program (NFIP), you must respond to this collection of information.

## PURPOSE OF THE ELEVATION CERTIFICATE

The Elevation Certificate is an important administrative tool of the National Flood Insurance Program (NFIP). It is to be used to provide elevation information necessary to ensure compliance with community floodplain management ordinances, to determine the proper insurance premium rate, and to support a request for a Letter of Map Amendment (LOMA) or Letter of Map Revision based on fill (LOMR-F).

The Elevation Certificate is required in order to properly rate post-FIRM buildings, which are buildings constructed after publication of the Flood Insurance Rate Map (FIRM), located in flood insurance Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. The Elevation Certificate is not required for pre-FIRM buildings unless the building is being rated under the optional post-FIRM flood insurance rules.

As part of the agreement for making flood insurance available in a community, the NFIP requires the community to adopt a floodplain management ordinance that specifies minimum requirements for reducing flood losses. One such requirement is for the community to obtain the elevation of the lowest floor (including basement) of all new and substantially improved buildings, and maintain a record of such information. The Elevation Certificate provides a way for a community to document compliance with the community's floodplain management ordinance.

Use of this certificate does not provide a waiver of the flood insurance purchase requirement. Only a LOMA or LOMR-F from the Federal Emergency Management Agency (FEMA) can amend the FIRM and remove the Federal mandate for a lending institution to require the purchase of flood insurance. However, the lending institution has the option of requiring flood insurance even if a LOMA/LOMR-F has been issued by FEMA. The Elevation Certificate may be used to support a LOMA or LOMR-F request. Lowest floor and lowest adjacent grade elevations certified by a surveyor or engineer will be required if the certificate is used to support a LOMA or LOMR-F request. A LOMA or LOMR-F request must be submitted with either a completed FEMA MT-EZ or MT-1 package, whichever is appropriate.

This certificate is used only to certify building elevations. A separate certificate is required for floodproofing. Under the NFIP, non-residential buildings can be floodproofed up to or above the Base Flood Elevation (BFE). A floodproofed building is a building that has been designed and constructed to be watertight (substantially impermeable to floodwaters) below the BFE. Floodproofing of residential buildings is not permitted under the NFIP unless FEMA has granted the community an exception for residential floodproofed basements. The community must adopt standards for design and construction of floodproofed basements before FEMA will grant a basement exception. For both floodproofed non-residential buildings and residential floodproofed basements in communities that have been granted an exception by FEMA, a floodproofing certificate is required.

Additional guidance can be found in the FEMA Floodplain Management Bulletin about using the Elevation Certificate, available on FEMA's website at [www.fema.gov/fima/fpmbul.shtm](http://www.fema.gov/fima/fpmbul.shtm). Click on "FEMA 467-1 Elevation Certificate Cover and Bulletin."

# ELEVATION CERTIFICATE

OMB No. 1660-0008  
Expires February 28, 2009

Important: Read the instructions on pages 1-8.

## SECTION A - PROPERTY INFORMATION

A1. Building Owner's Name <b>City of West Linn</b>		For Insurance Company Use: Policy Number
A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. <b>3821 Calaroga Drive</b>		Company NAIC Number

City **West Linn** State **Oregon** ZIP Code **97068**

A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)  
**Tax Parcel: 21E13CA01101. Site for City's Calaroga Sanitary Sewer Pump Station.**

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) **Non-Residential (sanitary sewer facilities)**

A5. Latitude/Longitude: Lat. **45.395851** Long. **-122.637414** Horizontal Datum:  NAD 1927  NAD 1983

A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.

A7. Building Diagram Number **N/A; 2 is as close as any of them.**

A8. For a building with a crawl space or enclosure(s), provide:

a) Square footage of crawl space or enclosure(s)	<b>N/A</b> sq ft	A9. For a building with an attached garage, provide:	a) Square footage of attached garage	<b>N/A</b> sq ft
b) No. of permanent flood openings in the crawl space or enclosure(s) walls within 1.0 foot above adjacent grade	<b>N/A</b>		b) No. of permanent flood openings in the attached garage walls within 1.0 foot above adjacent grade	<b>N/A</b>
c) Total net area of flood openings in A8.b	<b>N/A</b> sq in		c) Total net area of flood openings in A9.b	<b>N/A</b> sq in

## SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number		B2. County Name <b>Clackamas County</b>	B3. State <b>Oregon</b>
--	--	--	----------------------------

B4. Map/Panel Number <b>41005C0019D</b>	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/Revised Date <b>June 17, 2008</b>	B8. Flood Zone(s) <b>AE</b>	B9. Base Flood Elevation(s) (Zone AO, use base flood depth) <b>44'</b>
--	------------	---------------------	---	--------------------------------	---

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9.  
 FIS Profile  FIRM  Community Determined  Other (Describe) \_\_\_\_\_

B11. Indicate elevation datum used for BFE in Item B9:  NGVD 1929  NAVD 1988  Other (Describe) \_\_\_\_\_

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)?  Yes  No  
Designation Date \_\_\_\_\_  CBRS  OPA

## SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on:  Construction Drawings\*  Building Under Construction\*  Finished Construction  
\*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO. Complete Items C2.a-g below according to the building diagram specified in Item A7.  
Benchmark Utilized **PID AJ8198; City of West Linn Control Point Shepherd.** Vertical Datum **NAVD 1988**  
Conversion/Comments \_\_\_\_\_

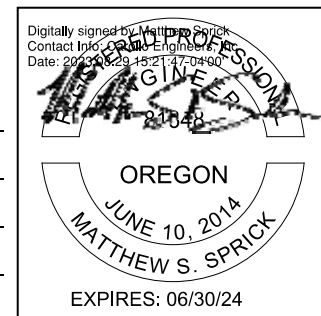
		Check the measurement used.
a) Top of bottom floor (including basement, crawl space, or enclosure floor)	<b>7.83 (wet well)</b> <input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
b) Top of the next higher floor	<b>39.52 (valve vault)</b> <input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
c) Bottom of the lowest horizontal structural member (V Zones only)	<b>N/A</b> <input type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
d) Attached garage (top of slab)	<b>N/A</b> <input type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment in Comments)	<b>8.22 (pumps)</b> <input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
f) Lowest adjacent (finished) grade (LAG)	<b>47 (storm drain rim)</b> <input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)
g) Highest adjacent (finished) grade (HAG)	<b>48 (gabion wall)</b> <input checked="" type="checkbox"/> feet	<input type="checkbox"/> meters (Puerto Rico only)

## SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. *I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.*

Check here if comments are provided on back of form.

**Matthew S Sprick** **81348**  
Certifier's Name License Number  
**Engineer** **Carollo Engineers, Inc**  
Title Company Name  
**707 SW Washington St, Suite 500** **Portland** **Oregon** **97205**  
Address City State ZIP Code  
**503-765-8904**  
Signature Date Telephone  
Digitally signed by Matthew Sprick  
Contact Info: Carollo Engineers, Inc  
Date: 2009.06.29 15:21:47-04'00'



<b>IMPORTANT: In these spaces, copy the corresponding information from Section A.</b>	For Insurance Company Use:
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. <b>3821 Calaroga Drive</b>	Policy Number
City <b>West Linn</b>	State <b>Oregon</b>
ZIP Code <b>97068</b>	Company NAIC Number

**SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION (CONTINUED)**

Copy both sides of this Elevation Certificate for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments

**This is for a sanitary sewer pump station the is equipped with submersible pumps and instruments and all structures (excluding electrical power and controls) are either flood proof or above the flood plain elevation (electrical and controls).**

Digitally signed by Matthew Sprick

Contact Info: Call 503-444-0000

Date: 2023.06.15 14:00

Signature 	Date	<input type="checkbox"/> Check here if attachments
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**SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)**

For Zones AO and A (without BFE), complete Items E1-E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B, and C. For Items E1-E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

- E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).
- a) Top of bottom floor (including basement, crawl space, or enclosure) is \_\_\_\_\_  feet  meters  above or  below the HAG.  
b) Top of bottom floor (including basement, crawl space, or enclosure) is \_\_\_\_\_  feet  meters  above or  below the LAG.
- E2. For Building Diagrams 6-8 with permanent flood openings provided in Section A Items 8 and/or 9 (see page 8 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is \_\_\_\_\_  feet  meters  above or  below the HAG.
- E3. Attached garage (top of slab) is \_\_\_\_\_  feet  meters  above or  below the HAG.
- E4. Top of platform of machinery and/or equipment servicing the building is \_\_\_\_\_  feet  meters  above or  below the HAG.
- E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance?  Yes  No  Unknown. The local official must certify this information in Section G.

**SECTION F - PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION**

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. *The statements in Sections A, B, and E are correct to the best of my knowledge.*

Property Owner's or Owner's Authorized Representative's Name			
Address	City	State	ZIP Code
Signature	Date	Telephone	
Comments			

Check here if attachments

**SECTION G - COMMUNITY INFORMATION (OPTIONAL)**

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8. and G9.

- G1.  The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)
- G2.  A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.
- G3.  The following information (Items G4.-G9.) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate Of Compliance/Occupancy Issued
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- G7. This permit has been issued for:  New Construction  Substantial Improvement
- G8. Elevation of as-built lowest floor (including basement) of the building: \_\_\_\_\_  feet  meters (PR) Datum \_\_\_\_\_
- G9. BFE or (in Zone AO) depth of flooding at the building site: \_\_\_\_\_  feet  meters (PR) Datum \_\_\_\_\_

Local Official's Name	Title
Community Name	Telephone
Signature	Date
Comments	

Check here if attachments

# Building Photographs

See Instructions for Item A6.

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			For Insurance Company Use:
			Policy Number
City	State	ZIP Code	Company NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least two building photographs below according to the instructions for Item A6. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." If submitting more photographs than will fit on this page, use the Continuation Page, following.

# Building Photographs

Continuation Page

Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.			For Insurance Company Use:
			Policy Number
City	State	ZIP Code	Company NAIC Number

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View."



## INSTRUCTIONS FOR COMPLETING THE ELEVATION CERTIFICATE

The Elevation Certificate is to be completed by a land surveyor, engineer, or architect who is authorized by law to certify elevation information when elevation information is required for Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. Community officials who are authorized by law or ordinance to provide floodplain management information may also complete this form. For Zones AO and A (without BFE), a community official, a property owner, or an owner's representative may provide information on this certificate, unless the elevations are intended for use in supporting a request for a LOMA or LOMR-F. Certified elevations must be included if the purpose of completing the Elevation Certificate is to obtain a LOMA or LOMR-F.

The property owner, the owner's representative, or local official who is authorized by law to administer the community floodplain ordinance can complete Section A and Section B. The partially completed form can then be given to the land surveyor, engineer, or architect to complete Section C. The land surveyor, engineer, or architect should verify the information provided by the property owner or owner's representative to ensure that this certificate is complete.

In Puerto Rico only, elevations for building information and flood hazard information may be entered in meters.

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### SECTION A – PROPERTY INFORMATION

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**Items A1.-A4.** This section identifies the building, its location, and its owner. Enter the name(s) of the building owner(s), the building's complete street address, and the lot and block numbers. If the building's address is different from the owner's address, enter the address of the building being certified. If the address is a rural route or a Post Office box number, enter the lot and block numbers, the tax parcel number, the legal description, or an abbreviated location description based on distance and direction from a fixed point of reference. For the purposes of this certificate, "building" means both a building and a manufactured (mobile) home.

A map may be attached to this certificate to show the location of the building on the property. A tax map, FIRM, or detailed community map is appropriate. If no map is available, provide a sketch of the property location, and the location of the building on the property. Include appropriate landmarks such as nearby roads, intersections, and bodies of water. For building use, indicate whether the building is residential, non-residential, an addition to an existing residential or non-residential building, an accessory building (e.g., garage), or other type of structure. Use the Comments area of the appropriate section if needed, or attach additional comments.

**Item A5.** Provide latitude and longitude coordinates for the center of the front of the building. Use either decimal degrees (e.g., 39.5043°, -110.7585°) or degrees, minutes, seconds (e.g., 39° 30' 15.5", -110° 45' 30.7") format. If decimal degrees are used, provide coordinates to at least 4 decimal places or better. When using degrees, minutes, seconds, provide seconds to at least 1 decimal place or better. The latitude and longitude coordinates must be accurate within 66 feet. If the Elevation Certificate is being certified by other than a licensed surveyor, engineer, or architect, this information is not required. Provide the type of datum used to obtain the latitude and longitude. FEMA prefers the use of NAD 1983.

**Item A6.** If the Elevation Certificate is being used to obtain flood insurance through the NFIP, the certifier must provide at least two photographs showing the front and rear of the building taken within 90 days from the date of certification. The photographs must be taken with views confirming the building description and diagram number provided in Section A. If the building has split-level or multi-level areas, provide at least two additional photographs showing side views of the building. All photographs must be in color and measure at least 3"x3". Digital photographs are acceptable.

**Item A7.** Select the diagram on pages 7-8 that best represents the building. Then enter the diagram number and use the diagram to identify and determine the appropriate elevations requested in Items C2.a-g. If you are unsure of the correct diagram, select the diagram that most closely resembles the building being certified.

**Item A8.a** Provide the square footage of the crawl space or enclosure(s) below the lowest elevated floor of an elevated building with or without permanent flood openings. Take the measurement from the outside of the crawl space or enclosure(s). Examples of elevated buildings constructed with crawl space and enclosure(s) are shown in Diagrams 6-8 on page 8. Diagram 2 or 4 should be used for a building constructed with a crawl space floor that is below the exterior grade on all sides.

**Items A8.b-c** Enter in Item A8.b the number of permanent flood openings in the crawl space or enclosure(s) walls that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches, excluding any bars, louvers, or other covers of the permanent flood openings, and enter the total in Item A8.c. If the net

area cannot be reasonably estimated, provide the size of the flood openings without consideration of any covers and indicate in the Comments area the type of cover that exists in the flood openings. If the crawl space or enclosure(s) walls have no permanent openings within 1.0 foot above adjacent grade, enter “0” (zero) in Items A8.b-c.

**Item A9.a** Provide the square footage of the attached garage with or without permanent flood openings. Take the measurement from the outside of the garage.

**Items A9.b-c** Enter in Item A9.b the number of permanent flood openings in the attached garage that are no higher than 1.0 foot above the adjacent grade. This includes any openings that are in the garage door that are no higher than 1.0 foot above the adjacent grade. Estimate the total net area of all such permanent flood openings in square inches and enter the total in Item A9.c. If the garage has no permanent flood openings within 1.0 foot above adjacent grade, enter “0” (zero) in Items A9.b-c.

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## SECTION B - FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

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Complete the Elevation Certificate on the basis of the FIRM in effect at the time of the certification.

The information for Section B is obtained by reviewing the FIRM panel that includes the building’s location. Information about the current FIRM is available from the Federal Emergency Management Agency (FEMA) by calling 1-800-358-9616. If a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR-F) has been issued by FEMA, please provide the letter date and case number in the Comments area of Section D or Section G, as appropriate.

For a building in an area that has been annexed by one community but is shown on another community’s FIRM, enter the community name and 6-digit number of the annexing community in Item B1, the name of the new county in Item B2, and the FIRM index date for the annexing community in Item B6. Enter information from the actual FIRM panel that shows the building location, even if it is the FIRM for the previous jurisdiction, in Items B4, B5, B7, B8, and B9.

**Item B1.** NFIP Community Name & Community Number. Enter the complete name of the community in which the building is located and the associated 6-digit community number. For a newly incorporated community, use the name and 6-digit number of the new community. Under the NFIP, a “community” is any State or area or political subdivision thereof, or any Indian tribe or authorized native organization, that has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. To determine the current community number, see the NFIP *Community Status Book*, available on FEMA’s web site at <http://www.fema.gov/fema/csb.shtm>, or call 1-800-358-9616.

**Item B2.** County Name. Enter the name of the county or counties in which the community is located. For an unincorporated area of a county, enter “unincorporated area.” For an independent city, enter “independent city.”

**Item B3.** State. Enter the 2-letter state abbreviation (for example, VA, TX, CA).

**Items B4.-B5.** Map/Panel Number and Suffix. Enter the 10-character “Map Number” or “Community Panel Number” shown on the FIRM where the building or manufactured (mobile) home is located. For maps in a county-wide format, the sixth character of the “Map Number” is the letter “C” followed by a four-digit map number. For maps not in a county-wide format, enter the “Community Panel Number” shown on the FIRM.

**Item B6.** FIRM Index Date. Enter the effective date or the map revised date shown on the FIRM Index.

**Item B7.** FIRM Panel Effective/Revised Date. Enter the map effective date or the map revised date shown on the FIRM panel. This will be the latest of all dates shown on the map. The current FIRM panel effective date can be determined by calling 1-800-358-9616.

**Item B8.** Flood Zone(s). Enter the flood zone, or flood zones, in which the building is located. All flood zones containing the letter “A” or “V” are considered Special Flood Hazard Areas. The flood zones are A, AE, A1-A30, V, VE, V1-V30, AH, AO, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO. Each flood zone is defined in the legend of the FIRM panel on which it appears.

**Item B9.** Base Flood Elevation(s). Using the appropriate Flood Insurance Study (FIS) Profile, Floodway Data Table, or FIRM panel, locate the property and enter the BFE (or base flood depth) of the building site. If the building is located in more than one flood zone in Item B8, list all appropriate BFEs in Item B9. BFEs are shown on a FIRM or FIS Profile for Zones A1-A30, AE, AH, V1-V30, VE, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO; flood depth numbers are shown for Zone AO. Use the AR BFE if the building is located in any of Zones AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO. In A or V zones where BFEs are not provided on the FIRM, BFEs may be available from another source. For example, the community may have established BFEs or obtained BFE data from other sources for the building site. For subdivisions and other developments of more than 50 lots or 5 acres, establishment of BFEs is required by the community’s floodplain management ordinance. If a BFE is obtained from another source, enter the BFE in Item B9. In an A Zone where BFEs are not available, complete Section E and enter N/A for Section B, Item B9. Enter the BFE to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

**Item B10.** Indicate the source of the BFE that you entered in Item B9. If the BFE is from a source other than FIS Profile, FIRM, or community, describe the source of the BFE.

**Item B11.** Indicate the elevation datum to which the elevations on the applicable FIRM are referenced as shown on the map legend. The vertical datum is shown in the Map Legend and/or the Notes to Users on the FIRM.

**Item B12.** Indicate whether the building is located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA). (OPAs are portions of coastal barriers that are owned by Federal, State, or local governments or by certain non-profit organizations and used primarily for natural resources protection.) Federal flood insurance is prohibited in designated CBRS areas or OPAs for buildings or manufactured (mobile) homes built or substantially improved after the date of the CBRS or OPA designation. For the first CBRS designations, that date is October 1, 1983. An information sheet explaining CBRS areas and OPAs may be obtained on FEMA’s web site at [http://www.fema.gov/fhm/fmc\\_cbrs.shtm](http://www.fema.gov/fhm/fmc_cbrs.shtm).

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### SECTION C - BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

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Complete Section C if the building is located in any of Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/AE, AR/A1-A30, AR/AH, or AR/AO, or if this certificate is being used to support a request for a LOMA or LOMR-F. If the building is located in Zone AO or Zone A (without BFE), complete Section E instead. To ensure that all required elevations are obtained, it may be necessary to enter the building (for instance, if the building has a basement or sunken living room, split-level construction, or machinery and equipment).

Surveyors may not be able to gain access to some crawl spaces to shoot the elevation of the crawl space floor. If access to the crawl space is limited or cannot be gained, follow one of these procedures.

- Use a yardstick or tape measure to measure the height from the floor of the crawl space to the “next higher floor,” and then subtract the crawl space height from the elevation of the “next higher floor.” If there is no access to the crawl space, use the exterior grade next to the structure to measure the height of the crawl space to the “next higher floor.”
- Contact the local floodplain administrator of the community in which the building is located. The community may have documentation of the elevation of the crawl space floor as part of the permit issued for the building.
- If the property owner has documentation or knows the height of the crawl space floor to the next higher floor, try to verify this by looking inside the crawl space through any openings or vents.

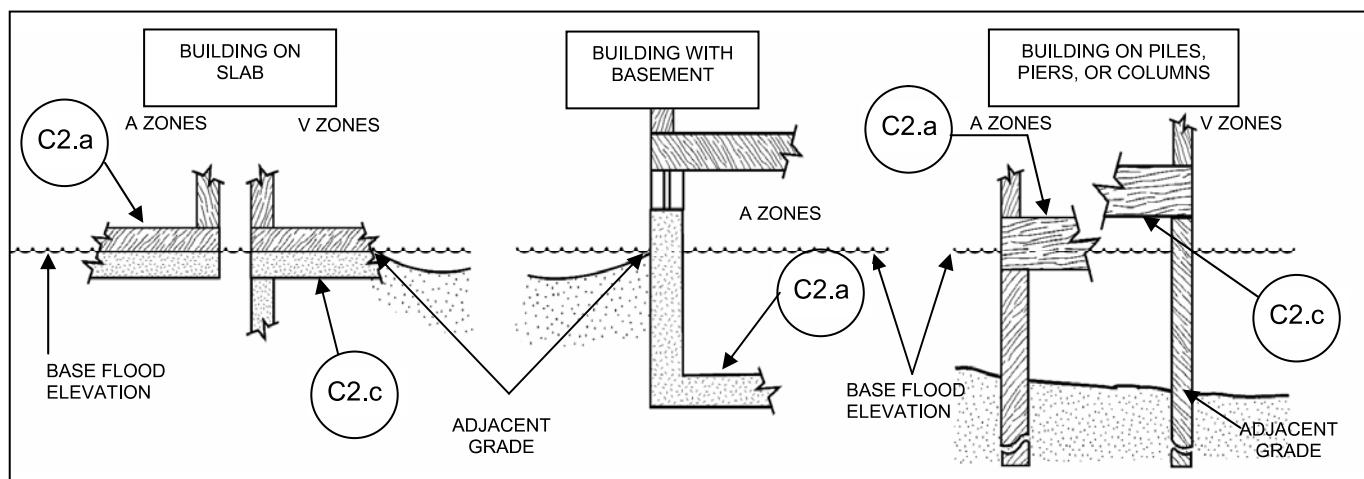
In all three cases, provide the elevation in the Comments area of Section D on the back of the form and a brief description of how the elevation was obtained.

**Item C1.** Indicate whether the elevations to be entered in this section are based on construction drawings, a building under construction, or finished construction. For either of the first two choices, a post-construction Elevation Certificate will be required when construction is complete. If the building is under construction, include only those elevations that can be surveyed in Items C2.a-g. Use the Comments area of Section D to provide elevations obtained from the construction plans or drawings. Select “Finished Construction” only when all machinery and/or equipment such as furnaces, hot water heaters, heat pumps, air conditioners, and elevators and their associated equipment have been installed and the grading around the building is completed.

**Item C2.** A field survey is required for Items C2.a-g. Provide the benchmark utilized, the vertical datum for that benchmark, and any datum conversion necessary. Most control networks will assign a unique identifier for each benchmark. For example, the National Geodetic Survey uses the Permanent Identifier (PID). For the benchmark utilized, provide the PID or other

unique identifier assigned by the maintainer of the benchmark. Also provide the vertical datum for the benchmark elevation. Show the conversion from the field survey datum used if it differs from the datum used for the BFE entered in Item B9 and indicate the conversion software used. All elevations for the certificate, including the elevations for Items C2.a-g, must be referenced to the datum on which the BFE is based. Show the datum conversion, if applicable, in this section or in the Comments area of Section D. For property experiencing ground subsidence, the most recent reference mark elevations must be used for determining building elevations. However, when subsidence is involved, the BFE should not be adjusted. Enter elevations in Items C2.a-g to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico).

**Items C2.a-d** Enter the building elevations (excluding the attached garage) indicated by the selected building diagram (Item A7.) in Items C2.a-c. If there is an attached garage, enter the elevation for top of attached garage slab in Item C2.d. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) If the building is located in a V zone on the FIRM, complete Item C2.c. If the flood zone cannot be determined, enter elevations for all of Items C2.a-g. For buildings in A zones, elevations a, b, d, and e should be measured at the top of the floor. For buildings in V zones, elevation c must be measured at the bottom of the lowest horizontal structural member of the floor (see drawing below). For buildings elevated on a crawl space, Diagram 8, enter the elevation of the top of the crawl space floor in Item C2.a, whether or not the crawl space has permanent flood openings (flood vents). *If any item does not apply to the building, enter "N/A" for not applicable.*



**Item C2.e** Enter the lowest platform elevation of at least one of the following machinery and equipment items: elevators and their associated equipment, furnaces, hot water heaters, heat pumps, and air conditioners in an attached garage or enclosure or on an open utility platform that provides utility services for the building. Note that elevations for these specific machinery and equipment items are required in order to rate the building for flood insurance. Local floodplain management officials are required to ensure that all machinery and equipment servicing the building are protected from flooding. Thus, local officials may require that elevation information for all machinery and equipment, including ductwork, be documented on the Elevation Certificate. If the machinery and/or equipment is mounted to a wall, pile, etc., enter the platform elevation of the machinery and/or equipment. Indicate machinery/equipment type in the Comments area of Section D or Section G, as appropriate. *If this item does not apply to the building, enter "N/A" for not applicable.*

**Items C2.f-g** Adjacent grade is defined as the elevation of the ground, sidewalk, patio slab, or deck support immediately next to the building. If the certificate is to be used to support a request for a LOMA or LOMR-F, provide in the Comments area the lowest adjacent grade elevation measured at the deck support or stairs if that elevation is lower than the building's lowest adjacent grade. For Zone AO, use the natural grade elevation, if available. This measurement must be to the nearest tenth of a foot (nearest tenth of a meter, in Puerto Rico) if this certificate is being used to support a request for a LOMA or LOMR-F.

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**SECTION D - SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION**

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Complete as indicated. This section of the Elevation Certificate may be signed by only a land surveyor, engineer, or architect who is authorized by law to certify elevation information. Place your license number, your seal (as allowed by the State licensing board), your signature, and the date in the box in Section D. You are certifying that the information on this certificate represents your best efforts to interpret the data available and that you understand that any false statement may be punishable

by fine or imprisonment under 18 U.S. Code, Section 1001. Use the Comments area of Section D, on the back of the certificate, to provide datum, elevation, or other relevant information not specified on the front.

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## SECTION E - BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO & ZONE A (WITHOUT BFE)

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Complete Section E if the building is located in Zone AO or Zone A (without BFE). Otherwise, complete Section C instead. Explain in the Section F Comments area if the measurement provided under Items E1.- E4. is based on the “natural grade.”

**Items E1.a and b** Enter in Item E1.a the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG). Enter in Item E1.b the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the top of the bottom floor (as indicated in the applicable diagram) above or below the lowest adjacent grade (LAG). For buildings in Zone AO, the community’s floodplain management ordinance requires the lowest floor of the building be elevated above the highest adjacent grade at least as high as the depth number on the FIRM. Buildings in Zone A (without BFE) may qualify for a lower insurance rate if an engineered BFE is developed at the site.

**Item E2.** For Building Diagrams 6-8 with permanent flood openings (see page 8), enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico) of the next higher floor or elevated floor (as indicated in the applicable diagram) above or below the highest adjacent grade (HAG).

**Item E3.** Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, for the top of attached garage slab. (Because elevation for top of attached garage slab is self-explanatory, attached garages are not illustrated in the diagrams.) *If this item does not apply to the building, enter “N/A” for not applicable.*

**Item E4.** Enter the height to the nearest tenth of a foot (tenth of a meter in Puerto Rico), in relation to the highest adjacent grade next to the building, of the platform elevation that supports the machinery and/or equipment servicing the building. Indicate machinery/equipment type in the Comments area of Section F. *If this item does not apply to the building, enter “N/A” for not applicable.*

**Item E5.** For those communities where this base flood depth is not available, the community will need to determine whether the top of the bottom floor is elevated in accordance with the community’s floodplain management ordinance.

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## SECTION F - PROPERTY OWNER (OR OWNER’S REPRESENTATIVE) CERTIFICATION

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Complete as indicated. This section is provided for certification of measurements taken by a property owner or property owner’s representative when responding to Sections A, B, and E. The address entered in this section must be the actual mailing address of the property owner or property owner’s representative who provided the information on the certificate.

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## SECTION G - COMMUNITY INFORMATION (OPTIONAL)

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Complete as indicated. The community official who is authorized by law or ordinance to administer the community’s floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Section C may be filled in by the local official as provided in the instructions below for Item G1. If the authorized community official completes Sections C, E, or G, complete the appropriate item(s) and sign this section.

Check **Item G1.** if Section C is completed with elevation data from other documentation, including elevations obtained from the Community Rating System Elevation Software, that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. Indicate the source of the elevation data and the date obtained in the Comments area of Section G. If you are both a community official and a licensed land surveyor, engineer, or architect authorized by law to certify elevation information, and you performed the actual survey for a building in Zones A1-A30, AE, AH, A (with BFE), VE, V1-V30, V (with BFE), AR, AR/A, AR/A1-A30, AR/AE, AR/AH, or AR/AO, you must also complete Section D.

Check **Item G2.** if information is entered in Section E by the community for a building in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

Check **Item G3**, if the information in Items G4.-G9, has been completed for community floodplain management purposes to document the as-built lowest floor elevation of the building. Section C of the Elevation Certificate records the elevation of various building components but does not determine the lowest floor of the building or whether the building, as constructed, complies with the community's floodplain management ordinance. This must be done by the community. Items G4.-G9, provide a way to document these determinations.

**Item G4.** Permit Number. Enter the permit number or other identifier to key the Elevation Certificate to the permit issued for the building.

**Item G5.** Date Permit Issued. Enter the date the permit was issued for the building.

**Item G6.** Date Certificate of Compliance/Occupancy Issued. Enter the date that the Certificate of Compliance or Occupancy or similar written official documentation of as-built lowest floor elevation was issued by the community as evidence that all work authorized by the floodplain development permit has been completed in accordance with the community's floodplain management laws or ordinances.

**Item G7.** New Construction or Substantial Improvement. Check the applicable box. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a building, the cost of which equals or exceeds 50 percent of the market value of the building before the start of construction of the improvement. The term includes buildings that have incurred substantial damage, regardless of the actual repair work performed.

**Item G8.** As-built lowest floor elevation. Enter the elevation of the lowest floor (including basement) when the construction of the building is completed and a final inspection has been made to confirm that the building is built in accordance with the permit, the approved plans, and the community's floodplain management laws or ordinances. Indicate the elevation datum used.

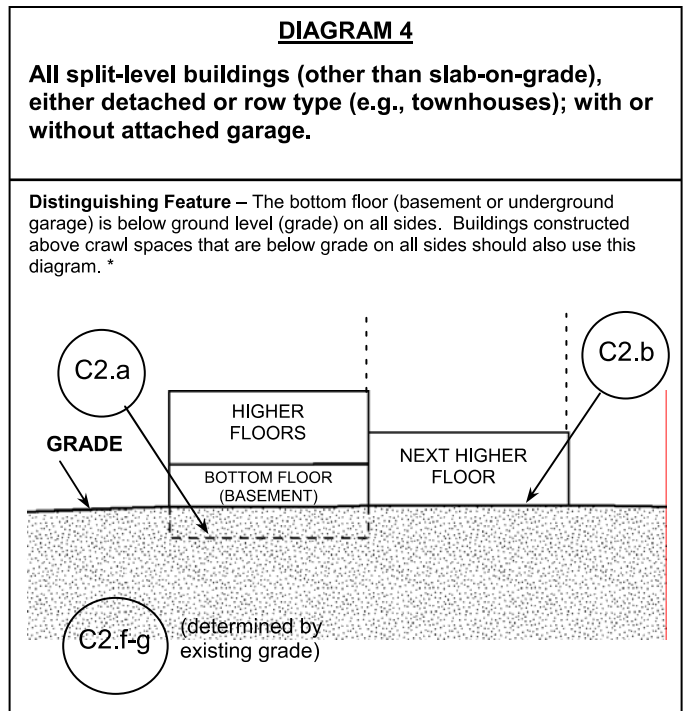
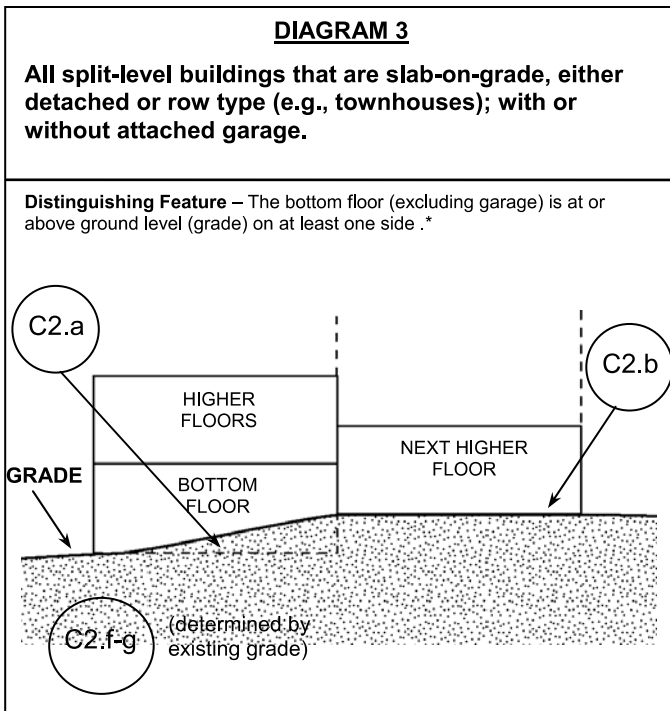
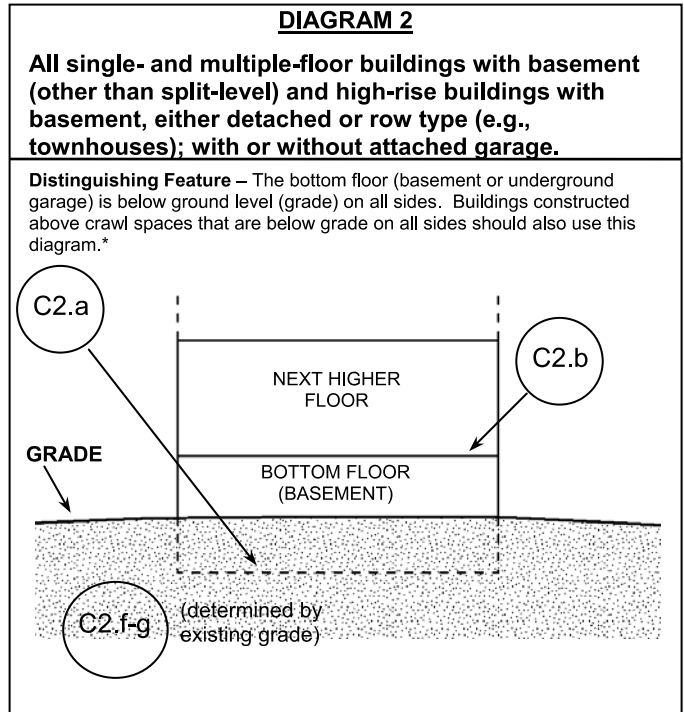
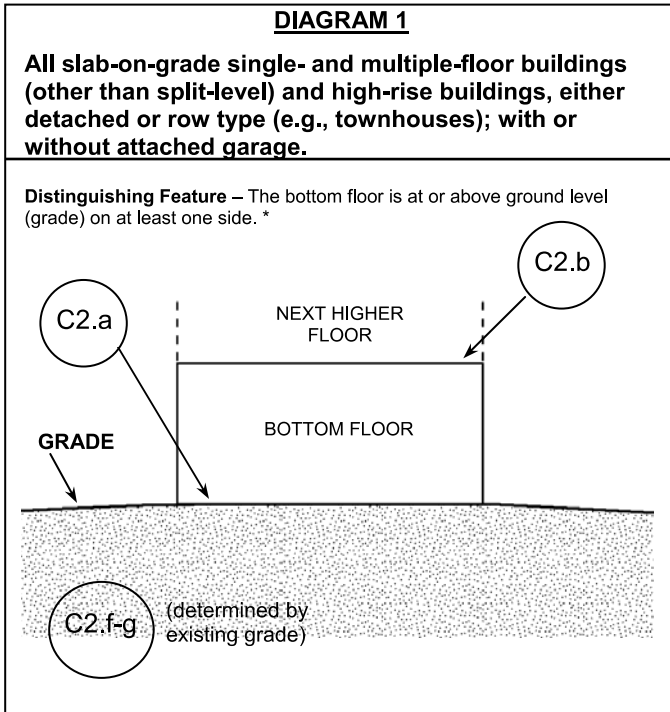
**Item G9.** BFE. Using the appropriate FIRM panel, FIS Profile, or other data source, locate the property and enter the BFE (or base flood depth) of the building site. Indicate the elevation datum used.

Enter your name, title, and telephone number, and the name of the community. Sign and enter the date in the appropriate blanks.

## BUILDING DIAGRAMS

The following eight diagrams illustrate various types of buildings. Compare the features of the building being certified with the features shown in the diagrams and select the diagram most applicable. Enter the diagram number in Item A7., the square footage of crawl space or enclosure(s) and the area of flood openings in square inches in Items A8.a-c, the square footage of attached garage and the area of flood openings in square inches in Items A9.a-c, and the elevations in Items C2.a-g.

In A zones, the floor elevation is taken at the top finished surface of the floor indicated; in V zones, the floor elevation is taken at the bottom of the lowest horizontal structural member (see drawing in instructions for Section C).

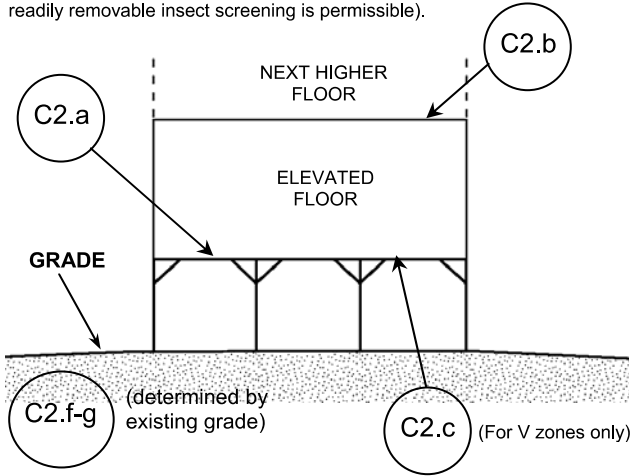


\* A floor that is below ground level (grade) on all sides is considered a basement even if the floor is used for living purposes, or as an office, garage, workshop, etc.

**DIAGRAM 5**

All buildings elevated on piers, posts, piles, columns, or parallel shear walls. No obstructions below the elevated floor.

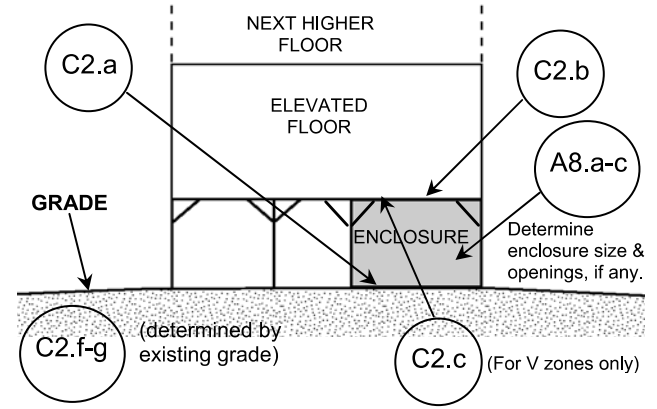
**Distinguishing Feature** – For all zones, the area below the elevated floor is open, with no obstruction to flow of flood waters (open lattice work and/or readily removable insect screening is permissible).



**DIAGRAM 6**

All buildings elevated on piers, posts, piles, columns, or parallel shear walls with full or partial enclosure below the elevated floor.

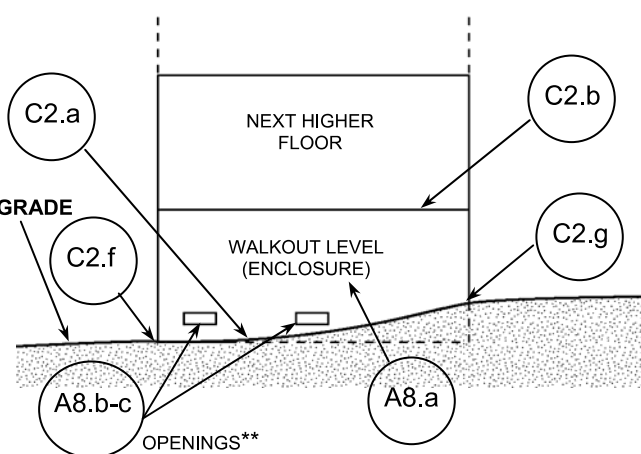
**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings\*\* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.



**DIAGRAM 7**

All buildings elevated on full-story foundation walls with a partially or fully enclosed area below the elevated floor. This includes walkout levels, where at least one side is at or above grade. The principal use of this building is located in the elevated floors of the building.

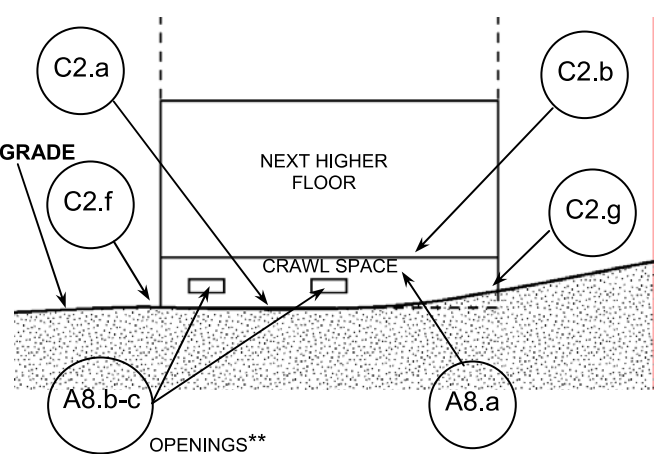
**Distinguishing Feature** – For all zones, the area below the elevated floor is enclosed, either partially or fully. In A Zones, the partially or fully enclosed area below the elevated floor is with or without openings\*\* present in the walls of the enclosure. Indicate information about enclosure size and openings in Section A – Property Information.



**DIAGRAM 8**

All buildings elevated on a crawl space with the floor of the crawl space at or above grade on at least one side, with or without an attached garage.

**Distinguishing Feature** – For all zones, the area below the first floor is enclosed by solid or partial perimeter walls. In all A zones, the crawl space is with or without openings\*\* present in the walls of the crawl space. Indicate information about crawl space size and openings in Section A – Property Information.



\*\* An "opening" is defined as a permanent opening in a wall that allows for the free passage of water automatically in both directions without human intervention. Under the NFIP, a minimum of two openings is required for enclosures or crawl spaces with a total net area of not less than one square inch for every square foot of area enclosed. Each opening must be on different sides of the enclosed area. If a building has more than one enclosed area, each area must have openings on exterior walls to allow floodwater to directly enter. The bottom of the openings must be no higher than one foot above the grade underneath the flood vents. Alternatively, you may submit a certification by a registered professional engineer or architect that the design will allow for the automatic equalization of hydrostatic flood forces on exterior walls. A window, a door, or a garage door is not considered an opening.



# Appendix G

TVF&R Service Provider Permit Response

## Corianne Burnett

---

**From:** Arn, Jason S. <Jason.Arn@tvfr.com>  
**Sent:** Monday, September 25, 2023 1:44 PM  
**To:** Corianne Burnett  
**Subject:** RE: Service Provider Letter - West Linn Sewer Lift Station

**CAUTION:** This email originated from outside Carollo Engineers. Do not open attachments or click links unless you recognize the sender.

Hi Carianne,

Yes, no need to apply for a service provider permit.

Thanks for checking.

**Jason Arn | Deputy Fire Marshal CFI**

Tualatin Valley Fire & Rescue

Direct: 503-259-1510

[www.tvfr.com](http://www.tvfr.com)

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**From:** Corianne Burnett <CBurnett@carollo.com>  
**Sent:** Monday, September 25, 2023 11:04 AM  
**To:** Arn, Jason S. <Jason.Arn@tvfr.com>  
**Subject:** Service Provider Letter - West Linn Sewer Lift Station

**\*\*\*The sender is from outside TVF&R – Do not click on links or attachments unless you are sure they are safe\*\*\***

Hi Jason,

Thank you for returning my call in regards to obtaining a Service Provider Letter for our Conditional Use Permit for the City of West Linn Planning Department.

Our project does not seem to apply to the intent of the Service Provider Letter as the structure is a below grade vault with no permanent access. Please see the attached site plan and profile of the project for your reference.

Thank you for your time.

**Corianne Burnett, PE\***

*Project Manager / Associate*

Carollo Engineers

707 SW Washington Street, Suite 500 / Portland, OR 97205

M 503.881.9604

[CBurnett@carollo.com](mailto:CBurnett@carollo.com) / [carollo.com](http://carollo.com)



*\*Professional registration(s) in specific states*

# Appendix H

## Property Owner Authorization

To: City of West Linn

Re: Calaroga Pump Station Conditional Use Permit Application

To whom it may concern:

We are the owners of the property located at 3891 Calaroga Drive/Tax Lot 21E13CA01100, adjacent to the City of West Linn's Calaroga Pump Station.

We hereby support and authorize a temporary construction easement, tree removal, mitigation plantings and soil improvements proposed on our property in conjunction with the City's improvements to the pump station, as shown in the attached figures. Soil improvements will include excavation of existing native soil which will be replaced by engineered fill and topsoil to existing grades and elevations.

Signed:

Robin Nicol

Name:

Robin Nicol

Date:

11/16/23

Signed:

Graham Nicol

Name:

GRAHAM NICOL

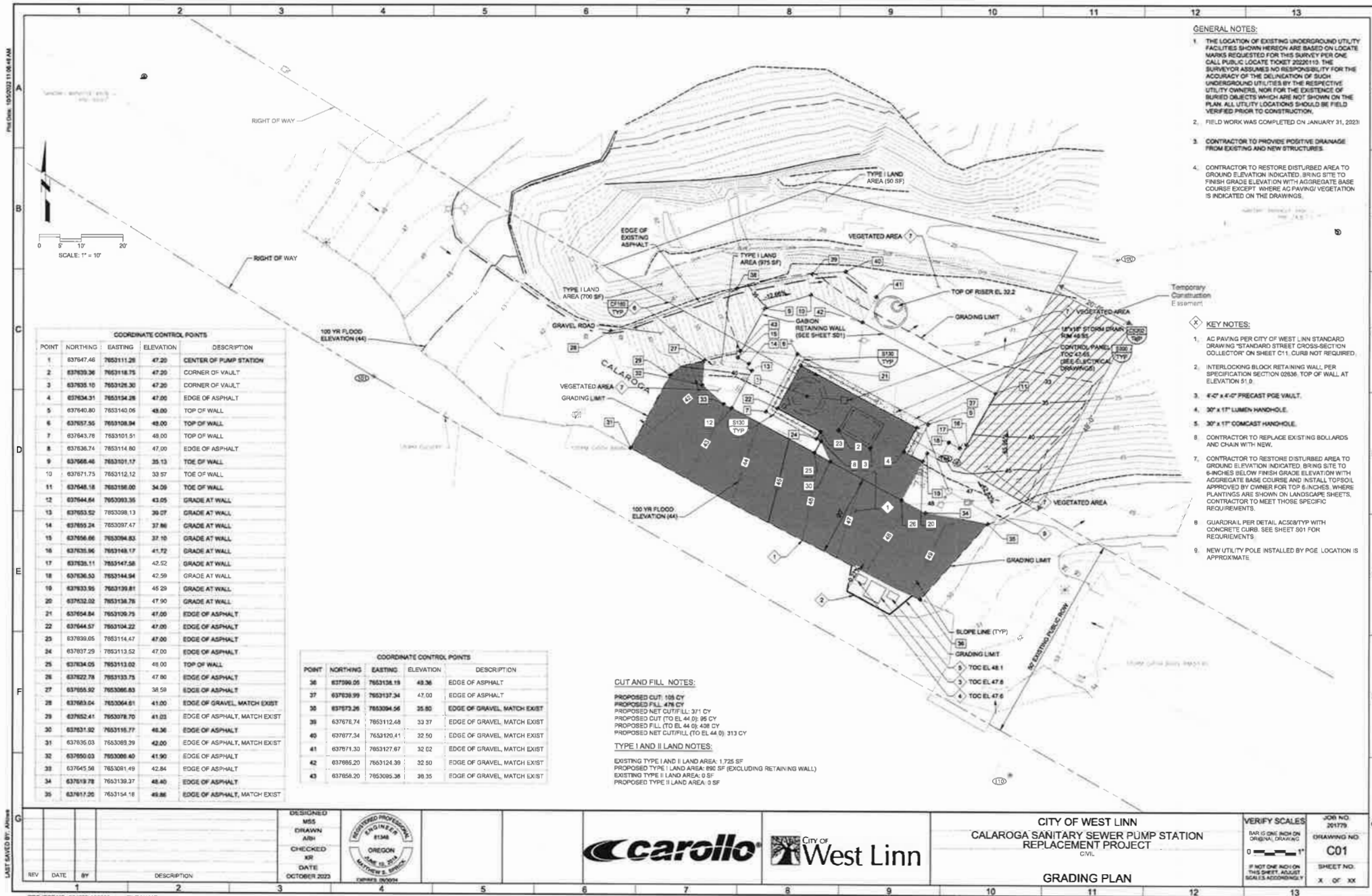
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11/16/23

Plot Date: 10/30/2023 11:06:41 AM

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PROJECT NO. 201779-100000 FILE NAME: 20177900C001.dwg



- GENERAL NOTES:**
1. THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS PROJECT PER ONE CALL PUBLIC LOCATE TICKET 20220119. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS. WORK FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
  2. FIELD WORK WAS COMPLETED ON JANUARY 31, 2023.
  3. CONTRACTOR TO PROVIDE POSITIVE DRAINAGE FROM EXISTING AND NEW STRUCTURES.
  4. CONTRACTOR TO RESTORE DISTURBED AREA TO GROUND ELEVATION INDICATED. BRING SITE TO FINISH GRADE ELEVATION WITH AGGREGATE BASE COURSE EXCEPT WHERE AG PAVING VEGETATION IS INDICATED ON THE DRAWINGS.

- KEY NOTES:**
1. AC PAVING PER CITY OF WEST LINN STANDARD DRAWING STANDARD STREET CROSS-SECTION COLLECTOR ON SHEET C11. CURB NOT REQUIRED.
  2. INTERLOCKING BLOCK RETAINING WALL, PER SPECIFICATION SECTION 0236. TOP OF WALL AT ELEVATION 51.0.
  3. 4" x 4" PRECAST PGE WALL.
  4. 30' x 1" LUMEN HAND-HOLE.
  5. 30' x 1" COMCAST HAND-HOLE.
  6. CONTRACTOR TO REPLACE EXISTING BOLLARDS AND CHAIN WITH NEW.
  7. CONTRACTOR TO RESTORE DISTURBED AREA TO GROUND ELEVATION INDICATED. BRING SITE TO 6-INCHES BELOW FINISH GRADE ELEVATION WITH AGGREGATE BASE COURSE AND INSTALL TOPSOIL APPROVED BY OWNER FOR TOP 6-INCHES. WHERE PLANTINGS ARE SHOWN ON LANDSCAPE SHEETS, CONTRACTOR TO MEET THOSE SPECIFIC REQUIREMENTS.
  8. GUARDRAIL PER DETAIL AC508/TYP WITH CONCRETE CURB. SEE SHEET S01 FOR REQUIREMENTS.
  9. NEW UTILITY POLE INSTALLED BY PGE. LOCATION IS APPROXIMATE.

COORDINATE CONTROL POINTS				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	637647.46	7653111.28	47.20	CENTER OF PUMP STATION
2	637639.36	7653118.75	47.20	CORNER OF VAULT
3	637635.10	7653128.30	47.20	CORNER OF VAULT
4	637634.31	7653134.28	47.00	EDGE OF ASPHALT
5	637640.80	7653140.06	48.00	TOP OF WALL
6	637637.35	7653108.94	48.00	TOP OF WALL
7	637643.78	7653101.51	48.00	TOP OF WALL
8	637636.74	7653114.80	47.00	EDGE OF ASPHALT
9	637668.46	7653101.17	35.13	TOE OF WALL
10	637671.75	7653112.12	33.57	TOE OF WALL
11	637648.18	7653138.00	34.09	TOE OF WALL
12	637644.64	7653093.35	43.05	GRADE AT WALL
13	637653.52	7653098.13	39.07	GRADE AT WALL
14	637659.24	7653097.47	37.86	GRADE AT WALL
15	637656.06	7653094.83	37.10	GRADE AT WALL
16	637635.96	7653148.17	41.72	GRADE AT WALL
17	637636.11	7653147.58	42.52	GRADE AT WALL
18	637636.53	7653144.94	42.59	GRADE AT WALL
19	637633.95	7653139.81	45.29	GRADE AT WALL
20	637632.02	7653138.78	47.90	GRADE AT WALL
21	637644.84	7653106.75	47.00	EDGE OF ASPHALT
22	637644.57	7653104.22	47.00	EDGE OF ASPHALT
23	637639.05	7653114.47	47.00	EDGE OF ASPHALT
24	637637.29	7653113.52	47.00	EDGE OF ASPHALT
25	637634.05	7653113.02	48.00	TOP OF WALL
26	637622.78	7653133.75	47.80	EDGE OF ASPHALT
27	637655.92	7653086.83	38.58	EDGE OF ASPHALT
28	637683.04	7653064.61	41.00	EDGE OF GRAVEL, MATCH EXIST
29	637652.41	7653078.70	41.03	EDGE OF ASPHALT, MATCH EXIST
30	637631.92	7653116.77	46.36	EDGE OF ASPHALT
31	637635.03	7653089.39	42.00	EDGE OF ASPHALT, MATCH EXIST
32	637650.03	7653086.40	41.90	EDGE OF ASPHALT
33	637645.58	7653081.49	42.84	EDGE OF ASPHALT
34	637619.78	7653139.37	48.40	EDGE OF ASPHALT
35	637617.20	7653154.18	48.86	EDGE OF ASPHALT, MATCH EXIST

COORDINATE CONTROL POINTS				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
36	637700.05	7653138.19	48.36	EDGE OF ASPHALT
37	637639.99	7653137.34	47.00	EDGE OF ASPHALT
38	637673.26	7653094.56	25.80	EDGE OF GRAVEL, MATCH EXIST
39	637678.74	7653112.48	33.37	EDGE OF GRAVEL, MATCH EXIST
40	637677.34	7653120.41	32.50	EDGE OF GRAVEL, MATCH EXIST
41	637671.30	7653127.67	32.02	EDGE OF GRAVEL, MATCH EXIST
42	637685.20	7653124.39	32.50	EDGE OF GRAVEL, MATCH EXIST
43	637684.20	7653089.38	38.35	EDGE OF GRAVEL, MATCH EXIST

**CUT AND FILL NOTES:**

PROPOSED CUT: 108 CY  
 PROPOSED FILL: 478 CY  
 PROPOSED NET CUT/FILL: 371 CY  
 PROPOSED CUT (TO EL. 44.0): 95 CY  
 PROPOSED FILL (TO EL. 44.0): 438 CY  
 PROPOSED NET CUT/FILL (TO EL. 44.0): 313 CY

**TYPE I AND II LAND NOTES:**

EXISTING TYPE I AND II LAND AREA: 1,725 SF  
 PROPOSED TYPE I LAND AREA: 890 SF (EXCLUDING RETAINING WALL)  
 EXISTING TYPE II LAND AREA: 0 SF  
 PROPOSED TYPE II LAND AREA: 0 SF

DESIGNED  
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DATE  
OCTOBER 2023



CITY OF WEST LINN  
 CALAROGA SANITARY SEWER PUMP STATION  
 REPLACEMENT PROJECT  
 CIVIL

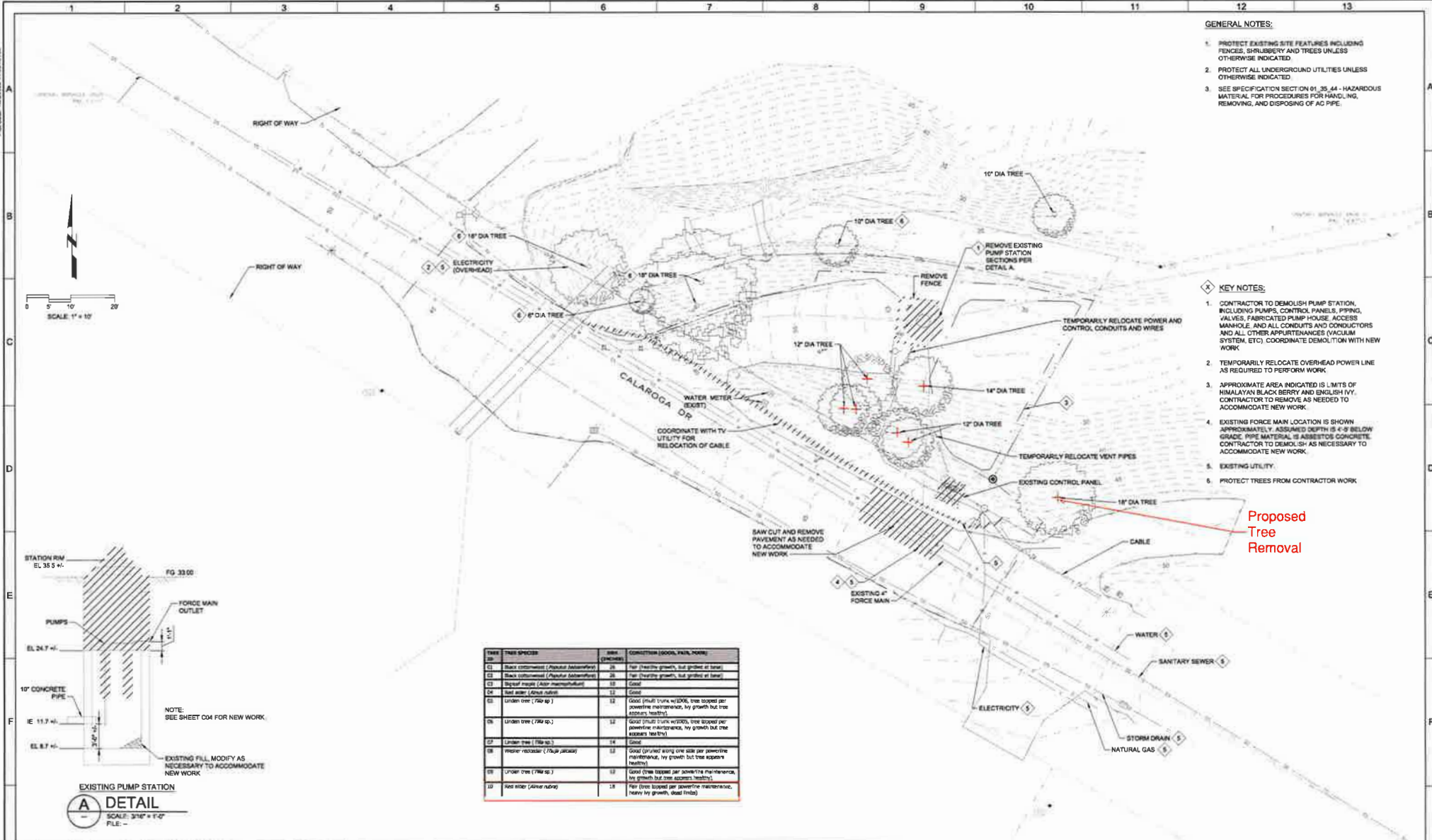
**GRADING PLAN**

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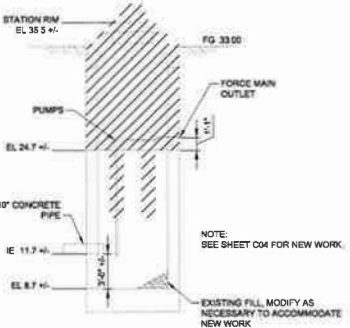
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- GENERAL NOTES:**
1. PROTECT EXISTING SITE FEATURES INCLUDING FENCES, SHRUBBERY AND TREES UNLESS OTHERWISE INDICATED.
  2. PROTECT ALL UNDERGROUND UTILITIES UNLESS OTHERWISE INDICATED.
  3. SEE SPECIFICATION SECTION 01\_35\_44 - HAZARDOUS MATERIAL FOR PROCEDURES FOR HANDLING, REMOVING, AND DISPOSING OF AC PIPE.

- KEY NOTES:**
1. CONTRACTOR TO DEMOLISH PUMP STATION, INCLUDING PUMPS, CONTROL PANELS, PIPING, VALVES, FABRICATED PUMP HOUSE, ACCESS MANHOLE, AND ALL CONDUITS AND CONDUCTORS AND ALL OTHER APPURTENANCES (VACUUM SYSTEM, ETC). COORDINATE DEMOLITION WITH NEW WORK.
  2. TEMPORARILY RELOCATE OVERHEAD POWER LINE AS REQUIRED TO PERFORM WORK.
  3. APPROXIMATE AREA INDICATED IS LIMITS OF HIMALAYAN BLACK BERRY AND ENGLISH IVY. CONTRACTOR TO REMOVE AS NEEDED TO ACCOMMODATE NEW WORK.
  4. EXISTING FORCE MAIN LOCATION IS SHOWN APPROXIMATELY. ASSUMED DEPTH IS 4'-8" BELOW GRADE. PIPE MATERIAL IS ASBESTOS CONCRETE. CONTRACTOR TO REMOVE AS NECESSARY TO ACCOMMODATE NEW WORK.
  5. EXISTING UTILITY.
  6. PROTECT TREES FROM CONTRACTOR WORK.



TREE	TREE SPECIES	DBH (INCHES)	CONDITION (GOOD, FAIR, POOR)
01	Black cottonwood ( <i>Alnus incana</i> )	26	Fair (healthy growth, but gnarled at base)
02	Black cottonwood ( <i>Alnus incana</i> )	26	Fair (healthy growth, but gnarled at base)
03	Signal juniper ( <i>Juniperus horizontalis</i> )	10	Good
04	Red cedar ( <i>Juniperus communis</i> )	12	Good
05	Linden tree ( <i>Tilia sp.</i> )	12	Good (multi trunk w/DX, tree topped per powerline maintenance, ivy growth but tree appears healthy)
06	Linden tree ( <i>Tilia sp.</i> )	12	Good (multi trunk w/DX, tree topped per powerline maintenance, ivy growth but tree appears healthy)
07	Linden tree ( <i>Tilia sp.</i> )	14	Good
08	Western redbud ( <i>Gliricidia sepium</i> )	12	Good (pruned along one side per powerline maintenance, ivy growth but tree appears healthy)
09	Linden tree ( <i>Tilia sp.</i> )	12	Good (tree topped per powerline maintenance, ivy growth but tree appears healthy)
10	Red cedar ( <i>Juniperus communis</i> )	18	Fair (tree topped per powerline maintenance, heavy ivy growth, dead limbs)

Proposed Tree Removal

**90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION**

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DRAWN  
ARE  
CHECKED

DATE  
JULY 2023

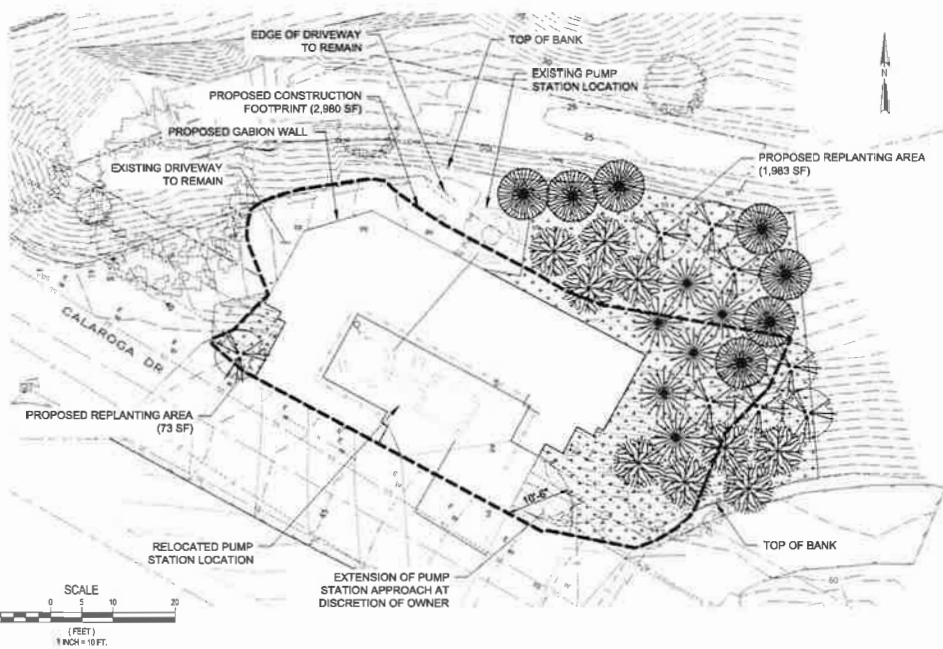


CITY OF WEST LINN  
CALAROGA SANITARY SEWER PUMP STATION  
REPLACEMENT PROJECT  
DEMOLITION

SITE PLAN

VERIFY SCALES  
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IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

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SHEET NO.  
X OF XX



**PLANT SCHEDULE:**

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	QTY
<b>TREES</b>					
	ACER CIRCINATUM	VINE MAPLE	1/2" CAL. B&B	AS SHOWN	8
	ACER MACROPHYLLUM	BIGLEAF MAPLE	1/2" CAL. B&B	AS SHOWN	9
	ALNUS RUBRA	RED ALDER	1/2" CAL. B&B	AS SHOWN	7
	THUJA PLICATA	WESTERN REDCEDAR	3" HT., 1/2" CAL. MIN. B&B	AS SHOWN	6
TOTAL PROPOSED TREES = 30					
<b>SHRUBS AND GROUNDCOVER</b>					
<b>SHRUBS</b>					
	POLYSTICHUM MUNITUM	WESTERN SWORD FERN	1 GAL. CONT., 12" HT. MIN.	48" O.C.	50
	SAMBUCUS RACEMOSA	RED ELDERBERRY		48" O.C.	49
	SYMPHORICARPOS ALBUS	COMMON SNOWBERRY		48" O.C.	50
TOTAL PROPOSED SHRUBS = 149					
<b>NATIVE SEED MIX</b>					
	ELYMUS GLAUCUS / BLUE WILDRIE		PLS SPECIFIED RATE LB/AC (PLS**)	APPLICATION RATE LB/AC (PLS**)	
	HORDEUM BRACHYANTHERUM / MEADOW BARLEY		26.1	43	0.05 AC
	BROMUS CARINATUS / CALIFORNIA BROME		13.0		
			4.3		

\* PLS = PURE LIVE SEED

**PLANTING NOTES:**

- PRIOR TO INSTALLATION OF PLANT MATERIAL, ALL INVASIVE SPECIES WITHIN PLANTING AREA SHALL BE REMOVED MANUALLY.
- ALL PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE OF PESTS AND DISEASE. STANDARDS SET FORTH IN "AMERICAN STANDARD FOR NURSERY STOCK" REPRESENT GUIDELINE SPECIFICATIONS ONLY AND SHALL CONSTITUTE MINIMUM QUALITY REQUIREMENTS FOR PLANT MATERIAL.
- COMBINE 3" DEPTH COMPOST WITH 8" DEPTH SANDY LOAM TOPSOIL WITHIN PLANTING PITS PRIOR TO PLANTING. REFER TO DETAILS FOR ADDITIONAL REQUIREMENTS FOR PLANTING SOILS WITHIN PLANTING PITS.
- ALL TREES SHALL HAVE A STRAIGHT TRUNK AND FULL HEAD.
- ALL MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT BEFORE, DURING, AND AFTER INSTALLATION.
- ALL TREE AND SHRUB PLANTING PITS SHALL BE MULCHED 3" IN DEPTH AND 18" IN DIAMETER WITH NON-CHEMICALLY TREATED COMPOSTED BARK OR LEAVES AS SHOWN IN THE TREE/SHRUB PLANTING INSTALLATION DETAIL.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL AVOID DAMAGE TO ALL UTILITIES DURING THE COURSE OF THE WORK. LOCATIONS OF EXISTING BURIED UTILITY LINES SHOWN ON THE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AND ARE TO BE CONSIDERED APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR 1) TO VERIFY THE LOCATIONS OF UTILITY LINES AND ADJACENT TO THE WORK AREA 2) TO PROTECT OF ALL UTILITY LINES DURING THE CONSTRUCTION PERIOD 3) TO REPAIR ANY AND ALL DAMAGE TO UTILITIES, STRUCTURES, SITE APPURTENANCES, ETC. WHICH OCCURS AS A RESULT OF THE CONSTRUCTION.
- SOIL WITHIN TEMPORARY CONSTRUCTION AREAS SHALL BE DECOMPACTED TO AN 18" DEPTH IN PLANTING AREAS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON THESE PLANS BEFORE PRICING THE WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE COVERAGE OF ALL PLANTING BEDS AS SHOWN ON THE PLANS AT SPACING SHOWN GRAPHICALLY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULLY MAINTAINING (INCLUDING BUT NOT LIMITED TO: WATERING, MULCHING, FERTILIZING, PRUNING, REPLACING) ALL OF THE PLANT MATERIALS FOR A PERIOD OF ONE YEAR. AT THE END OF THE MAINTENANCE PERIOD, THE WORK MUST BE ACCEPTED IN FULL BY THE OWNER.
- ANY PLANT MATERIAL WHICH IS DISEASED, DISTRESSED, DEAD, OR REJECTED (PRIOR TO SUBSTANTIAL COMPLETION) SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY, AND SIZE AND MEETING ALL PLANT LIST SPECIFICATIONS.
- THE CONTRACTOR SHALL COMPLETELY GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR. THE CONTRACTOR SHALL PROMPTLY MAKE ALL REPLACEMENTS DURING THE NORMAL PLANTING SEASON.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY SCHEDULE AND PROTECTION BETWEEN DELIVERY AND PLANTING TO MAINTAIN HEALTHY PLANT CONDITIONS.
- THE CONTRACTOR IS ENCOURAGED TO COMPLETE TEMPORARY OR PERMANENT MULCHING IN STAGES FOR SOIL STABILIZATION AS AREAS ARE COMPLETED AFTER GRADING.
- THIS PLAN DOES NOT PRESENT ANY TEMPORARY STABILIZATION MEASURES REQUIRED FOR EROSION CONTROL. SEE EROSION AND SEDIMENT CONTROL PLANS.
- BARE ROOT TREES SHALL BE PLANTED BETWEEN DECEMBER 1ST AND FEBRUARY 28TH. POTTED PLANTS SHALL BE PLANTED BETWEEN OCTOBER 15TH AND APRIL 30TH.
- THOROUGHLY WATER-IN ALL PLANT MATERIALS WITHIN 6 HOURS FOLLOWING INSTALLATION.

**MITIGATION AND PLANTING REQUIREMENTS:**

**REQUIRED MINIMUM ENHANCEMENT AREA**

DISTURBANCE TYPE	DISTURBANCE AREA	ENHANCEMENT REPLACEMENT MULTIPLIER	REQUIRED ENHANCEMENT AREA
PREVIOUSLY DISTURBED AREA*	2,980 SF	0.5	1,490 SF
TOTAL MINIMUM REQUIRED ENHANCEMENT AREA = 1,490 SF			

\* ENTIRE SUBJECT PARCEL CONSIDERED TO BE PDA DUE TO PREVIOUS PUMP STATION DEVELOPMENT

**TREE AND SHRUB PLANTING REQUIREMENTS**

PREVIOUSLY DISTURBED AREA	REQUIRED SHRUBS	PROPOSED SHRUBS	REQUIRED TREES	PROPOSED TREES
2,980 SF	PLANTED AT A RATE OF 25 SHRUBS PER EVERY 500 SF OF PDA. 2,980 SF / 500 SF = 5.96 X 25 SHRUBS = 149 SHRUBS	149**	PLANTED AT A RATE OF 5 TREES PER EVERY 500 SF OF PDA. 2,980 SF / 500 SF = 5.96 X 5 TREES = 29.8 TREES	30

\*\* 149 SHRUBS PLANTED WITH TRIANGULAR SPACING AT 48" O.C. REQUIRES A PLANTING AREA OF 2,056 SF

				<b>CITY OF WEST LINN</b> <b>CALAROGA SANITARY SEWER PUMP STATION</b> <b>REPLACEMENT PROJECT</b>	<b>VERIFY SCALES</b> BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"	JOB NO. 201779 DRAWING NO. SHEET NO. OF XX
REV. DATE BY DESCRIPTION 1 2 3 4 5 6 7 8 9 10 11 12 13	ONSIGNED TSD DRAWN TSD / KEMA CHECKED STF / EIRO DATE OCTOBER 2023	EXPIRES 02/22/18	PLANTING PLAN	PLANTING PLAN	0 1"	SHEET NO. OF XX

# Appendix I

## Tree Removal Permit





# CITY OF West Linn

## Tree Removal Permit

Please submit **pictures** of trees and **site map** with trees clearly identified to complete application.  
Please mark trees on site with ribbon, flagging tape or other marker.  
Email submissions are acceptable. Please do not fax pictures or site map.

### Property Owner

### Tree Site Address (if different)

Name City of West Linn  
Address 3821 Calacoga Dr  
Phone # 503-922-4728  
Email ryones@westlinnoregon.gov

### Number, Diameter, and Species of Trees:

Trees Numbered 4-9  
1. 5"-12"  
2. 1"-14"  
3. 1"-18"  
4. \_\_\_\_\_  
5. \_\_\_\_\_  
6. \_\_\_\_\_

### Reasons for Removal (code section 8.630)

Demolish and Rebuild Sewage Pump Station  
Raise elevation - trees will be buried or in the way

City of West Linn (Ryones)  
Owners Signature \_\_\_\_\_ Date 10-23-23

### Staff Only Below this Line

Approved  Not Approved \_\_\_\_\_  
Signature Ryones Date 10-26-23

### Reasons for Approval/Denial:

8.630-(D) - construction

### Conditions of Approval

If tree #10 needs removal, get neighbors permission

After a decision is made, there is a 10 day appeal period. If you do not hear from the City within this period then the tree may be removed on or after 10-6-23.  
This permit expires after one year.

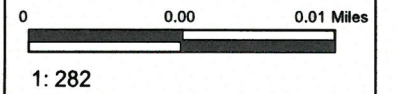
The approved permit must be clearly posted on site when tree removal is occurring.

City of West Linn Parks and Recreation Department  
22500 Salamo Rd., West Linn, OR 97068  
Ph. 503-557-4700 Fax 503-656-4106  
treepermits@westlinnoregon.gov



**Legend**

Addresses  
dissolved 0-5K



**Notes**

Trees to be Removed



**DAVID EVANS  
AND ASSOCIATES INC.**

**MEMORANDUM**

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**DATE:** September 19, 2023  
**TO:** Erich Lais (West Linn)  
**FROM:** Ethan Rosenthal, Ecologist, David Evans and Associates, Inc. (DEA)  
**SUBJECT:** Calaroga Pump Station Natural Resources Site Review  
**CC:** Corianne Burnett (Carollo), Susanna Julber (Conсор)

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**1. Introduction**

This memorandum reviews regulated natural resources in and adjacent to the Calaroga Sanitary Sewer Pump Station, located at 3821 S. Calaroga Drive, West Linn, Oregon. This review has been conducted to support local land use permitting related to improvements proposed for the pump station that is operated by the City of West Linn (City).

The pump station was constructed in the 1970's. The pump station consists of a buried wet well with a dry pit over the well and an at-grade access hatch. The below grade dry pit contains two 7.5 hp pumps, isolation and check valves, and piping. The wet well and dry pit are within the 100-year floodplain and could be flooded. Power and control panels for the pump station are located uphill from the wet well along Calaroga Drive, above the 100-year floodplain.

The 2019 Sanitary Sewer Master Plan identified the need to increase capacity of each pump in the station by 70,000 gallons per day to convey peak wet weather flows. In 2021, a more in-depth analysis of Calaroga Sanitary Sewer Pump Station was performed to identify the size of new pumps and associated wet well needed (Calaroga Sanitary Sewer Pump Station Capacity, Carollo Engineers, Inc., March 2021). In 2022, alternatives for Calaroga Sanitary Sewer Pump Station were prepared and the City selected construction of a new wet well located adjacent to Calaroga Drive to mitigate flood events (Calaroga Sanitary Sewer Pump Station Alternatives Analysis, Carollo Engineers, Inc., February 2022). Under City project PW-22-05, the existing pump station will be replaced with a facility that is not subject to flooding during a 100-year event and has increased capacity to convey peak wet weather flows.

**2. Methods**

The subject tax lot and adjacent off-site areas were reviewed for the potential presence of regulated wetlands and waterways during the 2021 investigation period. Adjacent off-site areas were visually inspected from the subject parcel and the public right of way due to lack of access. The 2021 review determined that no wetlands were present on-site or adjacent to the subject tax lot, but a perennial stream did run along the north property boundary. A follow up site visit occurred on January 18, 2023 to flag the ordinary high water mark of the stream, which was then surveyed by the project survey team. Riparian buffer conditions were also documented during this period.

The wetland and waters review was conducted using the Level 2 Routine Delineation Method described in the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987) and further supported by the Regional Supplement (Supplement) to the Corps of Engineers Wetland Delineation



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Manual, Western Mountains, Valleys, and Coast Region (USACE 2010). This method requires the simultaneous presence of hydrophytic vegetation, hydric soils, and positive wetland hydrology in wetland delineations.

Chapter 32 of the West Linn community development code (CDC) regulates work in Water Resource Areas (WRA). CDC Chapter 2 defines WRAs as “*Any water resource or riparian area identified in the West Linn WRA Map and the adjacent area of varying widths, established pursuant to Chapter 32 CDC, in which development activities are restricted in order to protect the functions and values of the associated water resource.*” Based on this definition, and further guidance in the CDC, the WRA consists of the water resource (e.g., wetland or stream) and an associated buffer that varies in width depending on slope steepness (e.g., less than or greater than 25% slope), fish presence, and other potential factors per Table 32-2 of the CDC. Buffer widths can range between 65 and 200 feet, except for ephemeral streams that can have a minimum width of 15 feet. The minimum width for a riparian corridor starts at 100 feet regardless of slope. However, the CDC allows a decreased WRA width when ecological functions can be maintained at a level that is “qualitatively equal” to those provided by the WRA width required by code.

The following background resources were reviewed:

- West Linn WRA Map (May 2014)
- U.S. Fish and Wildlife (USFWS) National Wetland Inventory (NWI) On-Line Mapper
- U.S. Department of Agriculture (USDA) Web Soil Survey
- Oregon Department of Fish and Wildlife (ODFW) Fish Distribution On-Line Mapper

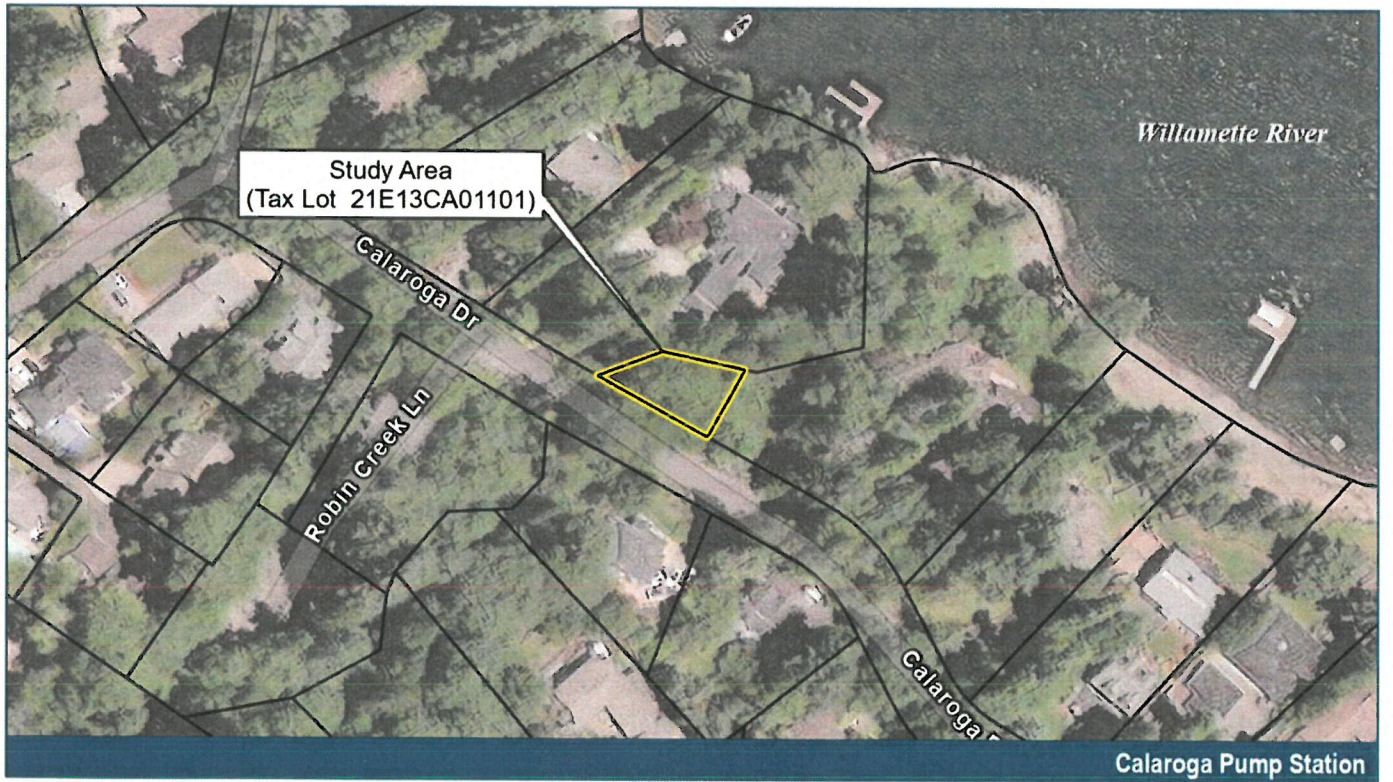
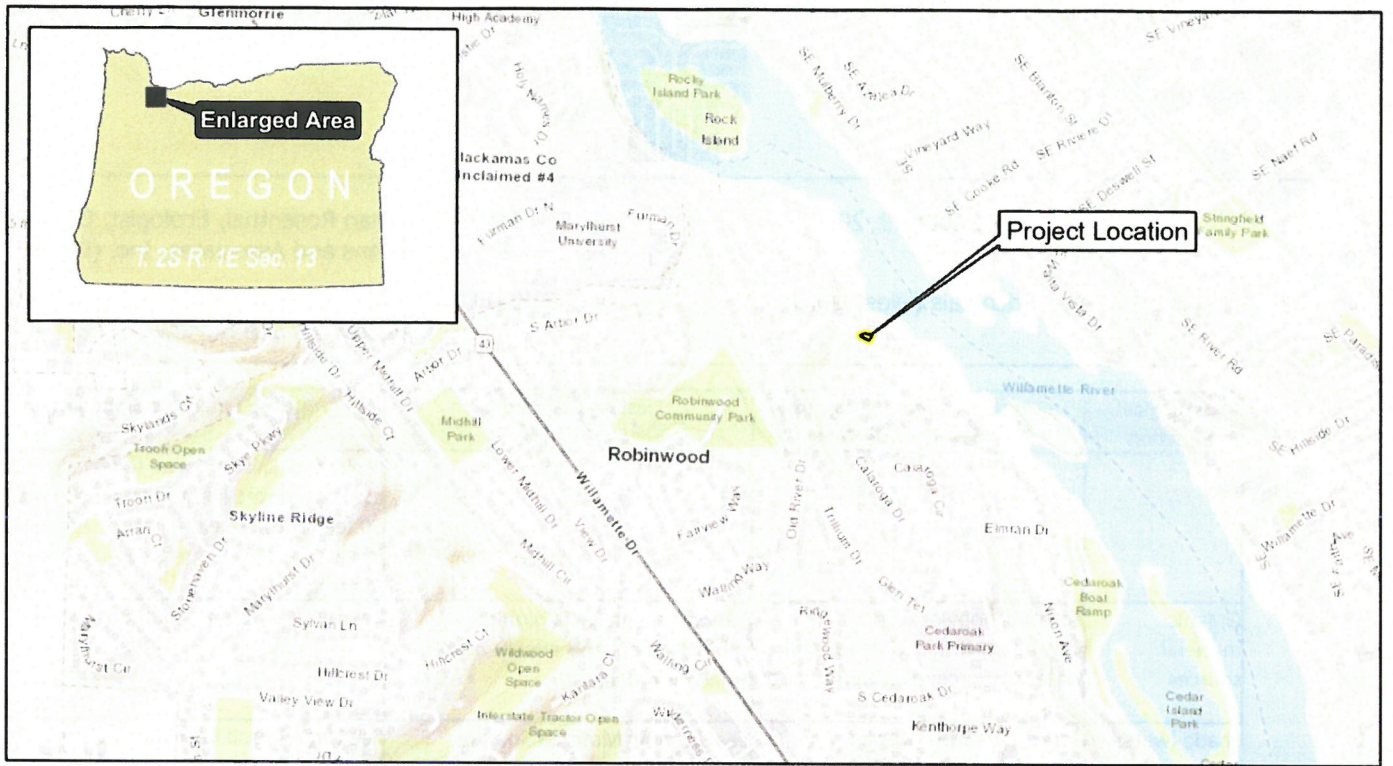
A tree survey was also conducted to inform review of project impacts associated with the City Community Tree Ordinance (CDC 8.500 – 8.798). Tree location and diameter at breast height (dbh) were recorded by the project surveyor. A DEA Ecologist conducted a site visit on July 3, 2023 to determine tree species and condition. The City’s list of heritage trees designated by the City Council was reviewed along with heritage tree designation criteria provided in CDC 8.710 to determine if heritage trees occur on or adjacent to the subject property or may potentially meet the criteria for designation as a heritage tree.

### **3. Existing Conditions Findings**

#### **3.1. Preliminary Information Review**

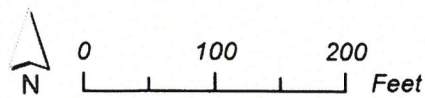
Reference materials noted in the methods section were reviewed prior to the field investigation to provide information regarding the possible presence of wetlands, water features, hydric soils (i.e., wetland soils), wetland hydrology, and site topography. This information revealed that hydric soils and/or wetlands are not mapped in the project vicinity. A perennial creek is mapped in the vicinity and West Linn WRA mapping (West Linn 2014) highlights the riparian corridor as a “significant” Goal 5 resource. ODFW maps the creek as providing rearing habitat to coho salmon (*Oncorhynchus kisutch*) and potentially supporting cutthroat trout (*Oncorhynchus clarkia*), up to the Calaroga Drive culvert crossing.

Based on a review of the City list of designated heritage trees, no heritage trees are currently designated on the subject parcel or nearby.



ESRI World Topo Map, World Imagery

**Figure 1**  
Vicinity





**DATE:** September 19, 2023

**FROM:** Ethan Rosenthal, Ecologist, David Evans and Associates, Inc. (DEA)

**TO:** Erich Lais (West Linn)

**SUBJECT:** Calaroga Pump Station Natural Resources Site Review

Ecological Function	Landscape Features Potentially Providing the Function	Existing Conditions	Proposed Enhanced Conditions
			replanted. Existing trees to remain will continue to provide forest canopy within 50 feet of the stream. Forest canopy will increase as mitigation trees grow to maturity.
Organic material sources	Forest canopy or woody vegetation within 100 feet of a water resource; or within a flood area.	Canopy coverage is high on the subject parcel and absent on the adjacent parcel.	See Large Wood Recruitment above.
Shade (water temperature moderation) and microclimate	Forest canopy or woody vegetation within 100 feet of the water resource. Roughly 300 feet of continuous canopy for microclimate.	See Organic Material Sources above.	See Large Wood Recruitment above.
Stream flow that sustains in-stream and adjacent habitats	Seasonal or perennial flow.	Trillium creek is a perennial creek.	The project design includes use of gabion walls and porous rock that will allow rainfall to infiltrate into the ground and sustain in-stream and adjacent habitats.
Other terrestrial habitat	Forest canopy natural vegetation contiguous to and within 100 to 300 feet of the water resource.	Site has high canopy coverage but is developed (paved) and/or has high percentage of invasives in the understory.	The site will be enhanced with native riparian forest plantings supporting terrestrial habitat.

**Attachments:**

- **Figures**
  - Figure 1, Vicinity Map
  - Figure 2, Existing Conditions
  - Planting Plan Design Sheets (L01 and L02)
- **Photo Log**



**DATE:** September 19, 2023

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**Table 3. Summary of Ecological Functions Under Existing and Proposed Conditions**

Ecological Function	Landscape Features Potentially Providing the Function	Existing Conditions	Proposed Enhanced Conditions
Stream flow moderation and/or water storage	A wetland or other water body with a hydrologic connection to a stream or flood area, the presence of fallen trees and density of vegetation in the WRA that slows the flow of storm water and increases its ability to retain sediment and infiltrate storm water, and the porosity of the WRA's surface to enable it to infiltrate storm water.	No wetlands or other water body is present other than Trillium Creek. Existing pavement increases direct runoff to the stream. This is offset to a degree by existing canopy cover. Presence of invasive English ivy and Himalayan blackberry on subject property is stressing existing vegetation and could eventually reduce the health and canopy cover, thereby adversely affecting this function. Adjacent property consists of blackberry thicket (i.e., little canopy cover).	Replacement of the ivy and blackberry with native shrubs and trees will increase canopy cover which will help moderate runoff and allow for more infiltration. Ivy and blackberry stressors will be removed.
Sediment or pollution control	Vegetation within 100 feet of a WRA on gentle slopes and up to 200 feet of a WRA if the slope is greater than 25%. The presence of fallen trees and other material that slows the flow of water and increase the ability to retain sediment, absorb pollutants and infiltrate storm water; the composition and density of vegetation; slope; and soils.	Current ground cover is minimal, with a high percent of bare ground under the existing canopy on the subject property. Canopy cover on adjacent lot is lacking. These factors result in greater potential for sediment runoff. However, erosion was not observed.	The mitigation plan proposes planting a variety and density of plants compared with existing conditions. Canopy cover overall will be increased. This will help prevent erosion and retain sediment and slow the flow of storm water.
Bank stabilization	Root masses, existing large rocks or anchored large wood along the stream bank.	The existing bank appears stable. Several grade control weirs occur in the stream, which help to reduce bank erosion. Riparian vegetation along the bank is fairly limited due to the adjacent driveway. The adjacent property has some native shrubs directly along the bank but only invasive blackberry just back from the bank.	Construction work areas will avoid existing native vegetation along the banks. Invasive plants near the streambank will be removed by hand and exposed soils will be replanted with native shrubs and trees and temporarily stabilized with jute matting.
Large wood recruitment for a fish bearing section of stream	Forest canopy within 50 to 150 feet of a fish bearing stream.	A few large trees within the subject property occur directly along the bank. All other trees are relatively small and/or have been topped due to power line maintenance. Thus, existing large wood recruitment from the subject and adjacent properties is fairly limited.	The West Linn WRA Map shows Trillium Creek as a fish-bearing stream within the study area. Oregon Department of Fish and Wildlife maps the creek as fish bearing up to the Calaroga Drive culvert crossing. Six trees beyond 25 feet from the creek will be removed from the proposed development footprint and



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TREE ID	TREE SPECIES	DBH (INCHES)	REASON FOR REMOVAL
09	Linden tree ( <i>Tilia sp.</i> )	12	In proposed development footprint

Permanent impacts to 2,445 square feet (sq. ft.) of riparian buffer will occur as a result of the proposed development (i.e., pump station and gabion wall) (Figure 3). No work will occur north of the existing driveway and pump station, thus avoiding impacts along the creek bank and within the creek.

#### 4.3. Proposed Riparian Buffer Mitigation

CDC 32.090(B and C) specifies a preference for on-site mitigation and requires a mitigation ratio for impacts to previously disturbed buffer of 0.5 square feet of mitigation for every square foot of impact. The entire subject parcel is considered previously disturbed. The project is proposing on-site mitigation in the form of enhancement along the east side of the property where no development is proposed. This area contains a large patch of invasive Himalayan blackberry and English ivy that will be removed and enhanced with native riparian forest plantings. The mitigation/enhancement plantings will be extended into the adjacent property because sufficient square footage is not available on the subject parcel. Per review with the City Planning Department, the adjacent parcel will be considered on-site due to the contiguity with the subject parcel mitigation. The adjacent parcel contains no trees within the proposed mitigation area and is dominated by an invasive Himalayan blackberry thicket.

Proposed mitigation is shown on the attached Planting Plan design sheets (L01 and L02). The required minimum area of mitigation, based on the CDC mitigation ratio, is 1,223 sq. ft. (0.5 x 2,445 sq ft of impact). However, due to the CDC tree and shrub quantity and spacing requirements, an additional 464 sq. ft. of planting area is required to accommodate all plantings. Therefore, the total proposed mitigation area is 1,697 sq. ft, which includes 858 sq. ft. on the subject parcel and 839 sq. ft. on the adjacent parcel. Proposed mitigation design is attached and has been prepared in accordance with CDC 32.100 Revegetation Plan Requirements.

#### 4.4. Ecological Functions

The City of West Linn development code permits limited development within the WRA when in compliance with approval criteria for the alternate review process (West Linn CDC 32.080). One of these criteria requires maintaining the level of ecological functions provided by the specific WRA, which in this case is the Riparian Corridor. West Linn CDC defines a Riparian Corridor as an area within and adjacent to a WRA providing vegetative, forested and habitat values. The West Linn CDC Table 32-4 lists WRA ecological functions and provides examples of landscape features that may support each function. Table 3 compares ecological functions for the site under existing and proposed conditions. The proposed mitigation is designed to maintain the ecological functions at the site.





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### 3.2. Field Review

The pump station tax lot is situated in a moderate to steeply sloping ravine in a suburban wooded setting. Trillium Creek, a tributary to the Willamette River, flows along the confined ravine bottom (see attached Photo Log). Pump station facilities consist of a short access driveway and the existing pump station that is surrounded by chain link fence. These facilities may have been graded into the hillside or placed along a natural narrow bench adjacent to the top of the stream bank. Areas bordering the developed portion of the site contain a mix of native and non-native riparian vegetation. Native vegetation consisted of an overstory of black cottonwood (*Populus balsamifera*), and red alder (*Alnus rubra*), with red cedar (*Thuja plicata*) observed nearby. Native understory consists of sword fern (*Polystichum munitum*). Non-native species consisted of English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus armeniacus*). The ivy was mixed in with native vegetation and predominantly found along the edges of the access driveway and Calaroga Drive. The blackberry primarily occurred as a large patch along the east and south sides of the pump station.

Tree survey results are provided in Table 1. Tree identification numbers were designated by DEA and are shown on the existing conditions Figure 2. As previously noted, there are **no mapped heritage trees** on or near the project vicinity. Furthermore, none of the project trees had characteristics matching the criteria for heritage trees outlined in CDC 8.710 Heritage Trees.

**Table 1 Tree Survey Results**

TREE ID	TREE SPECIES	DBH (INCHES)	CONDITION (GOOD, FAIR, POOR)
01	Black cottonwood ( <i>Populus balsamifera</i> )	26	Fair (healthy growth, but girdled at base)
02	Black cottonwood ( <i>Populus balsamifera</i> )	26	Fair (healthy growth, but girdled at base)
03	Bigleaf maple ( <i>Acer macrophyllum</i> )	10	Good
04	Red alder ( <i>Alnus rubra</i> )	12	Good
05	Linden tree ( <i>Tilia</i> sp.)	12	Good (multi trunk w/ID06, tree topped per powerline maintenance, ivy growth but tree appears healthy)
06	Linden tree ( <i>Tilia</i> sp.)	12	Good (multi trunk w/ID05, tree topped per powerline maintenance, ivy growth but tree appears healthy)
07	Linden tree ( <i>Tilia</i> sp.)	14	Good
08	Wester redcedar ( <i>Thuja plicata</i> )	12	Good (pruned along one side per powerline maintenance, ivy growth but tree appears healthy)
09	Linden tree ( <i>Tilia</i> sp.)	12	Good (tree topped per powerline maintenance, ivy growth but tree appears healthy)
10	Red alder ( <i>Alnus rubra</i> )	18	Fair (tree topped per powerline maintenance, heavy ivy growth, dead limbs)



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Field review determined that no wetlands were present on-site or adjacent to the subject tax lot, but a perennial stream (Trillium Creek) did run along the north property boundary. The ordinary high-water mark of the stream was flagged based on indicators of scour and presence/absence of persistent vegetation along the bank line. The stream is a relatively steep perennial stream with cobble, gravel, and silt substrates. Rock grade control structures are present below the culvert outfall at Calaroga Drive, creating a series of step pools. The south bank drops fairly steeply from the edge of the developed pump station site, with OHW occurring 3 to 4 feet below the top of bank.

The field-verified WRA consists of Trillium Creek and an existing vegetated buffer that is less than the required 100-foot width due to surrounding development. The entire tax parcel is entirely within the first 50 feet of the regulated buffer, as measured perpendicular from OHW to the southwest property corner. The off-site portion of the regulated 100-foot-wide WRA extends into unimproved and improved right-of-way and adjacent residential properties. Figure 2 displays the tax parcel boundaries, the existing on-site development (as described above) and the buffer within the project limits of disturbance. Ecological functions of the WRA are supported by the existing native vegetation, but are reduced as a result of existing development (i.e. pavement) and non-native invasive vegetation that is adversely affecting native species. Additional review of ecological functions is provided in Section 4.

#### **4. Proposed Work, Riparian Buffer Impacts, Mitigation, and Ecological Functions**

##### **4.1. Proposed Work**

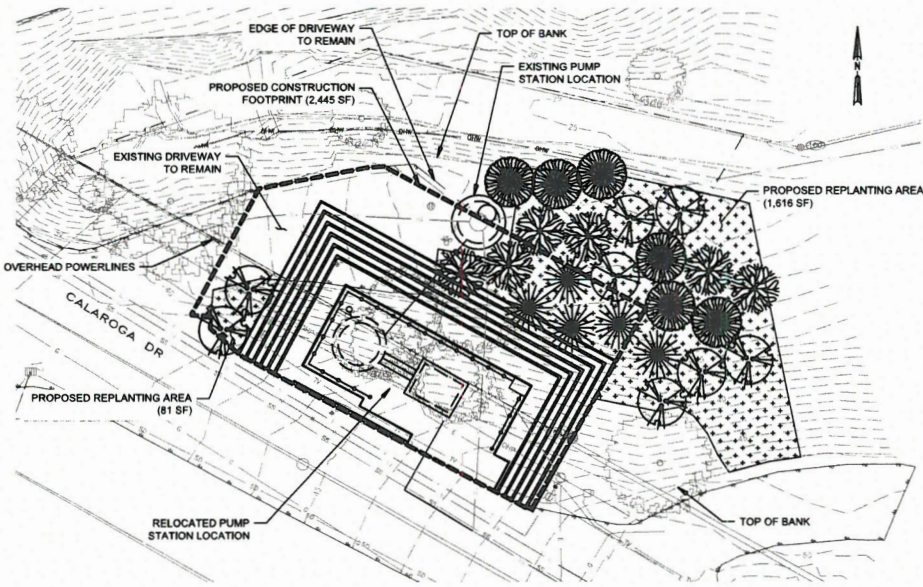
The City is proposing to rebuild the pump station, elevating it above the 100 year flood elevation. This will include installation of a gabion retaining wall, back filling the area behind the wall to a level ground surface and constructing the new pump station. A manhole will be left in place where the current pump station resides. The existing access driveway will also be left in place. No work is proposed below the OHW mark of Trillium Creek.

##### **4.2. Proposed Tree and Riparian Buffer Impacts**

Table 2 lists the trees proposed to be removed as a result of the project. All tree removal is needed because the trees occur within the development footprint of the project.

**Table 2 Tree Proposed for Removal**

<b>TREE ID</b>	<b>TREE SPECIES</b>	<b>DBH (INCHES)</b>	<b>REASON FOR REMOVAL</b>
04	Red alder ( <i>Alnus rubra</i> )	12	In proposed development footprint
05	Linden tree ( <i>Tilia sp.</i> )	12	In proposed development footprint
06	Linden tree ( <i>Tilia sp.</i> )	12	In proposed development footprint
07	Linden tree ( <i>Tilia sp.</i> )	14	In proposed development footprint
08	Wester redcedar ( <i>Thuja plicata</i> )	12	In proposed development footprint



**PLANT SCHEDULE:**

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	QTY
<b>TREES</b>					
	ACER CIRCINATUM	VINE MAPLE	1/2" CAL. B&B	AS SHOWN	8
	ACER MACROPHYLLUM	BIGLEAF MAPLE	1/2" CAL. B&B	AS SHOWN	6
	ALNUS RUBRA	RED ALDER	1/2" CAL. B&B	AS SHOWN	6
	THUJA PLICATA	WESTERN REDCEDAR	1/2" CAL. B&B	AS SHOWN	5
TOTAL PROPOSED TREES = 25					
<b>SHRUBS AND GROUNDCOVER</b>					
<b>SHRUBS</b>					
	POLYSTICHUM MUNITUM	WESTERN SWORD FERN	1 GAL. CONT., 12" HT. MIN.	48" O.C.	41
	SAMBUCUS RACEMOSA	RED ELDERBERRY		48" O.C.	41
	SYMPHORICARPOS ALBUS	COMMON SNOWBERRY		48" O.C.	41
TOTAL PROPOSED SHRUBS = 123					
<b>NATIVE SEED MIX</b>					
	ELYMUS GLAUCUS / BLUE WILDRYE	26.1	PLS SPECIFIED RATE LB/AC (PLS <sup>2</sup> )	APPLICATION RATE LB/AC (PLS <sup>2</sup> )	0.04 AC
	HORDEUM BRACHYANTHERUM / MEADOW BARLEY	13.0			
	BROMUS CARINATUS / CALIFORNIA BROME	4.3			

\* PLS = PURE LIVE SEED

**MITIGATION AND PLANTING REQUIREMENTS:**

**REQUIRED MINIMUM ENHANCEMENT AREA**

DISTURBANCE TYPE	DISTURBANCE AREA	ENHANCEMENT REPLACEMENT MULTIPLIER	REQUIRED ENHANCEMENT AREA
PREVIOUSLY DISTURBED AREA*	2,445 SF	0.5	1,223 SF
TOTAL MINIMUM REQUIRED ENHANCEMENT AREA = 1,223 SF			

\* ENTIRE SUBJECT PARCEL CONSIDERED TO BE PDA DUE TO PREVIOUS PUMP STATION DEVELOPMENT

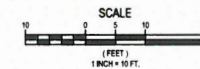
**TREE AND SHRUB PLANTING REQUIREMENTS**

PREVIOUSLY DISTURBED AREA	REQUIRED SHRUBS	PROPOSED SHRUBS	REQUIRED TREES	PROPOSED TREES
2,445 SF	PLANTED AT A RATE OF 25 SHRUBS PER EVERY 500 SF OF PDA: 2,445 SF / 500 SF = 4.89 X 25 SHRUBS = 122.25 SHRUBS	123**	PLANTED AT A RATE OF 5 TREES PER EVERY 500 SF OF PDA: 2,445 SF / 500 SF = 4.89 X 5 TREES = 24.45 TREES	25

\*\* 123 SHRUBS PLANTED WITH TRIANGULAR SPACING AT 48" O.C. REQUIRES A PLANTING AREA OF 1,697 SF

**PLANTING NOTES:**

- PRIOR TO INSTALLATION OF PLANT MATERIAL, ALL INVASIVE SPECIES WITHIN PLANTING AREA SHALL BE REMOVED MANUALLY.
- ALL PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, AND FREE OF PESTS AND DISEASE. STANDARDS SET FORTH IN "AMERICAN STANDARD FOR NURSERY STOCK" REPRESENT GUIDELINE SPECIFICATIONS ONLY AND SHALL CONSTITUTE MINIMUM QUALITY REQUIREMENTS FOR PLANT MATERIAL.
- REFER TO DETAILS FOR REQUIREMENTS FOR PLANTING SOILS WITHIN PLANTING PITS.
- ALL TREES SHALL HAVE A STRAIGHT TRUNK AND FULL HEAD.
- ALL MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT BEFORE, DURING, AND AFTER INSTALLATION.
- ALL TREE AND SHRUB PLANTING PITS SHALL BE MULCHED 3" IN DEPTH AND 18" IN DIAMETER WITH NON-CHEMICALLY TREATED COMPOSTED BARK OR LEAVES AS SHOWN IN THE TREE/SHRUB PLANTING INSTALLATION DETAIL.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL AVOID DAMAGE TO ALL UTILITIES DURING THE COURSE OF THE WORK. LOCATIONS OF EXISTING BURIED UTILITY LINES SHOWN ON THE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AND ARE TO BE CONSIDERED APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR 1) TO VERIFY THE LOCATIONS OF UTILITY LINES AND ADJACENT TO THE WORK AREA 2) TO PROTECT ALL UTILITY LINES DURING THE CONSTRUCTION PERIOD 3) TO REPAIR ANY AND ALL DAMAGE TO UTILITIES, STRUCTURES, SITE APPURTENANCES, ETC. WHICH OCCURS AS A RESULT OF THE CONSTRUCTION.
- SOIL WITHIN TEMPORARY CONSTRUCTION AREAS SHALL BE DECOMPACTED TO AN 18" DEPTH IN PLANTING AREAS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON THESE PLANS BEFORE PRICING THE WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE COVERAGE OF ALL PLANTING BEDS AS SHOWN ON THE PLANS AT SPACING SHOWN GRAPHICALLY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULLY MAINTAINING (INCLUDING BUT NOT LIMITED TO: WATERING, MULCHING, FERTILIZING, PRUNING, REPLACING) ALL OF THE PLANT MATERIALS FOR A PERIOD OF ONE YEAR, AT THE END OF THE MAINTENANCE PERIOD, THE WORK MUST BE ACCEPTED IN FULL BY THE OWNER.
- ANY PLANT MATERIAL WHICH IS DISEASED, DISTRESSED, DEAD, OR REJECTED (PRIOR TO SUBSTANTIAL COMPLETION) SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY, AND SIZE AND MEETING ALL PLANT LIST SPECIFICATIONS.
- THE CONTRACTOR SHALL COMPLETELY GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR. THE CONTRACTOR SHALL PROMPTLY MAKE ALL REPLACEMENTS DURING THE NORMAL PLANTING SEASON.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DELIVERY SCHEDULE AND PROTECTION BETWEEN DELIVERY AND PLANTING TO MAINTAIN HEALTHY PLANT CONDITIONS.
- THE CONTRACTOR IS ENCOURAGED TO COMPLETE TEMPORARY OR PERMANENT MULCHING IN STAGES FOR SOIL STABILIZATION AS AREAS ARE COMPLETED AFTER GRADING.
- THIS PLAN DOES NOT PRESENT ANY TEMPORARY STABILIZATION MEASURES REQUIRED FOR EROSION CONTROL. SEE EROSION AND SEDIMENT CONTROL PLANS.
- BARE ROOT TREES SHALL BE PLANTED BETWEEN DECEMBER 1ST AND FEBRUARY 28TH. POTTED PLANTS SHALL BE PLANTED BETWEEN OCTOBER 15TH AND APRIL 30TH.
- THOROUGHLY WATER-IN ALL PLANT MATERIALS WITHIN 6 HOURS FOLLOWING INSTALLATION.



PROJECT: CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT  
 WEST LINN, OREGON  
 SHEET TITLE: PLANTING PLAN

BY: NO. DATE REVISION

90% PLANS

PRELIMINARY

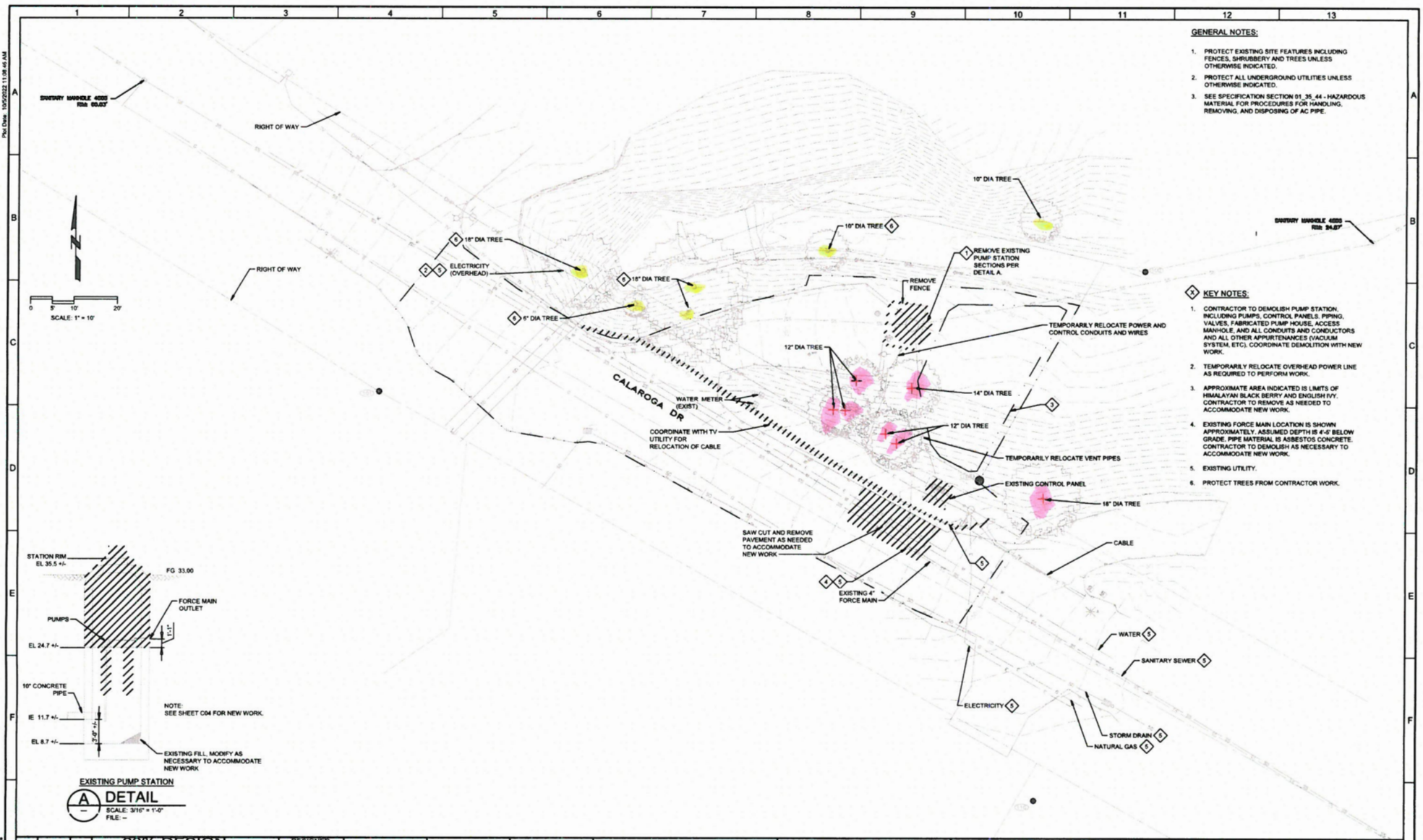
DATE: 09/20/23  
 DESIGN: T. DANISCH  
 DRAWN: K. ROBERT, DANISCH

SHEET NO.

L01

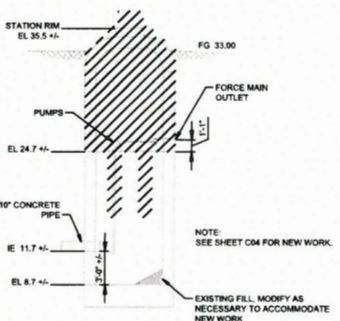
PROJECT NO. CARO0000-4621





- GENERAL NOTES:**
1. PROTECT EXISTING SITE FEATURES INCLUDING FENCES, SHRUBBERY AND TREES UNLESS OTHERWISE INDICATED.
  2. PROTECT ALL UNDERGROUND UTILITIES UNLESS OTHERWISE INDICATED.
  3. SEE SPECIFICATION SECTION 91.38.44 - HAZARDOUS MATERIAL FOR PROCEDURES FOR HANDLING, REMOVING, AND DISPOSING OF AC PIPE.

- KEY NOTES:**
1. CONTRACTOR TO DEMOLISH PUMP STATION, INCLUDING PUMPS, CONTROL PANELS, PIPING, VALVES, FABRICATED PUMP HOUSE, ACCESS MANHOLE, AND ALL CONDUITS AND CONDUCTORS AND ALL OTHER APPURTENANCES (VACUUM SYSTEM, ETC). COORDINATE DEMOLITION WITH NEW WORK.
  2. TEMPORARILY RELOCATE OVERHEAD POWER LINE AS REQUIRED TO PERFORM WORK.
  3. APPROXIMATE AREA INDICATED IS LIMITS OF HIMALAYAN BLACK BERRY AND ENGLISH SPY. CONTRACTOR TO REMOVE AS NEEDED TO ACCOMMODATE NEW WORK.
  4. EXISTING FORCE MAIN LOCATION IS SHOWN APPROXIMATELY ASSUMED DEPTH IS 4'-0" BELOW GRADE. PIPE MATERIAL IS ASBESTOS CONCRETE. CONTRACTOR TO DEMOLISH AS NECESSARY TO ACCOMMODATE NEW WORK.
  5. EXISTING UTILITY.
  6. PROTECT TREES FROM CONTRACTOR WORK.



<p>90% DESIGN SUBMITTAL NOT FOR CONSTRUCTION</p>		<p>DESIGNED MISS</p> <p>DRAWN ARE</p> <p>CHECKED</p> <p>DATE JULY 2021</p>			<p>CITY OF WEST LINN</p> <p>CALAROGA SANITARY SEWER PUMP STATION REPLACEMENT PROJECT</p> <p>DEMOLITION</p> <p>SITE PLAN</p>	<p>VERIFY SCALES</p> <p>BAR IS ONE INCH ON ORIGINAL DRAWING</p> <p>0 1"</p> <p>IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY</p>	<p>JOB NO. 201779</p> <p>DRAWING NO. D01</p> <p>SHEET NO. X OF XX</p>
<p>REV</p> <p>DATE</p> <p>BY</p> <p>DESCRIPTION</p>	<p>1</p> <p>2</p>	<p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>8</p> <p>9</p> <p>10</p> <p>11</p> <p>12</p> <p>13</p>					

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**Photo 1:** Looking south at slope where proposed pump station to be placed. Bare ground, English ivy, and a few sword ferns. Linden tree in mid-ground. (7/3/23)



**Photo 2:** Looking west, upstream, at Trilium Creek and very narrow riparian fringe between creek and existing pump station driveway. (1/18/23)





**Photo 3:** Cottonwood tree along creek bank between driveway and creek. The tree has been girdled presumably by beaver. Protective fencing not placed low enough. Healthy green growth was observed, but tree may eventually die. (7/3/23)



**Photo 4:** Blackberry thicket on adjacent property to be replanted with native plants as part of mitigation. (7/3/23)