



WILSON
ENGINEERING

LAKE WHATCOM WATER & SEWER DISTRICT
BELLINGHAM, WASHINGTON

CONTRACT DOCUMENTS
FOR THE CONSTRUCTION OF

DIVISION 7 RESERVOIR
REPLACEMENT PROJECT

WILSON PROJECT 2021-130
LAKE WHATCOM WATER & SEWER DISTRICT PROJECT #C2111

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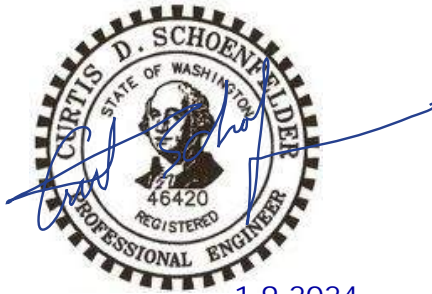
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THIS PROJECT IS FUNDED IN PART BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) AND WASHINGTON STATE EMERGENCY MANAGEMENT DIVISION (WA-EMD) THROUGH THE HAZARD MITIGATION ASSISTANCE PROGRAM. FEMA SUBGRANT NUMBER: 4309-18

SECTION 00 01 05 – CERTIFICATION PAGE

I hereby certify that these contract documents were prepared by me or under my direct supervision and that I am a duly licensed engineer under the laws of the State of Washington.



*** END OF SECTION ***

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***** END OF SECTION *****

PART 1

BIDDING REQUIREMENTS

ADVERTISEMENT FOR BIDS

Lake Whatcom Water and Sewer District (“District”) will receive sealed Bid proposals for the following project:

TITLE: Division 7 Reservoir Replacement Project
(District Project No. C2111)

DESCRIPTION: Construct two new concrete reservoirs (each 237,900 gallons) and associated piping, appurtenances, and site improvements. Demolish existing 1-million-gallon steel reservoir. Project is located in the Sudden Valley Community of Bellingham, WA.

ESTIMATED BASE BID COST RANGE: \$2.0M - \$2.4M
(Not including sales tax)

SUBMITTAL TIME/DATE/LOCATION: **Prior to 2:05 P.M. PST,
Tuesday, February 27, 2024**
Lake Whatcom Water and Sewer District
1220 Lakeway Drive
Bellingham, WA 98229
Public Bid Opening will commence at approximately 2:10 P.M. at the same location. The project bid opening will be broadcast live to the public using an online meeting platform. Prior to the bid opening an e-mail with an invitation and instructions to join the bid opening will be sent to all Plan Holders on the list maintained by WCR Plan Center.

PRE-BID MEETING: A non-mandatory pre-Bid meeting will be held at the project site main access entrance to The Firs: 1740 Lake Whatcom Blvd, Bellingham, WA at **10:00 A.M. PST, Wednesday, January 24, 2024**, for the purpose of answering questions from prospective Bidders.

Plans and specifications can be viewed and downloaded at: WCR Plan Center, 2215 Midway Lane, Suite 208, Bellingham, WA 98226 (360) 738-0370 or on the internet at www.myplancenter.com. Plans and specifications can be viewed at: Lake Whatcom Water and Sewer District Office, 1220 Lakeway Drive, Bellingham, WA 98229 (360) 734-9224.

Award of the contract(s) will be to the lowest responsive responsible Bidder.

Please direct questions regarding this project to the Consultant Wilson Engineering, LLC, Curt Schoenfelder, PE, 360-733-6100 x 1233, cschoenfelder@wilsonengineering.com, **no later than Friday, February 9, 2024**. Within 24 hours following the bid opening, Bidders may obtain Bid results at www.myplancenter.com.

Bidder Responsibility will be evaluated for this project. In determining Bidder responsibility, the Owner shall consider an overall accounting of the criteria set forth in “DIVISION 00300 SUPPLEMENTAL

BIDDER RESPONSIBILITY CRITERIA". Please direct questions regarding this subject to the office of the Consultant.

Lake Whatcom Water and Sewer District reserves the right to accept or reject any or all proposals and to waive informalities or irregularities.

INSTRUCTIONS TO BIDDERS

PART 0 – GENERAL CONDITIONS

0.1 EXPLANATION TO PROSPECTIVE BIDDERS

- A. A. In accordance with RCW 39.04.380 pertaining to a **Reciprocal Preference for Resident Contractors**, any public works bid received from a nonresident contractor from a state that provides an in-state percentage bidding preference, a comparable percentage disadvantage must be applied to the bid of that nonresident contractor.

A nonresident contractor from a state that provides a percentage bid preference means a contractor that:

1. Is from a state that provides a percentage bid preference to its resident contractors bidding on public works contracts; and
2. At the time of bidding on a public works project, does not have a physical office located in Washington.

The state of residence for a nonresident contractor is the state in which the contractor was incorporated or, if not a corporation, the state where the contractor's business entity was formed.

All nonresident contractors will be evaluated for out of state bidder preference. If the state of the nonresident contractor provides an in-state contractor preference, a comparable percentage disadvantage will be applied to their bid prior to contract award.

This section does not apply to public works procured pursuant to RCW 39.04.155, 39.04.280, or any other procurement exempt from competitive bidding.

- B. Any prospective Bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must submit a request in writing to the Architect/Engineer (A/E) not later than 7 calendar days before the Bid due date. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective Bidder concerning a solicitation will be furnished promptly to all other prospective Bidders by addendum to the solicitation, if that information is necessary in submitting Bids or if the lack of it would be prejudicial to other prospective Bidders.

0.2 PREPARATION OF BIDS – CONSTRUCTION

- A. Bids must be: (1) submitted on the Bid proposal forms, or copies of forms, furnished by the Owner or the Owner's agent, and (2) signed in ink. The person signing a Bid must initial each change appearing on any Bid form. If the Bid is made by a corporation, it shall be signed by the corporation's authorized designee empowered to make a binding

commitment for the corporation with the Bid. The address of the Bidder shall be typed or printed on the Bid form in the space provided.

- B. A complete set of Bidding Documents shall be used in preparing Bids; neither Owner nor A/E assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents. Bidder shall be solely responsible for obtaining a complete set of Bidding Documents and relying on same for Bid preparation.
- C. The Bid form may require Bidders to submit Bid prices for one or more items on various bases, including: (1) lump sum base Bid; (2) lump sum Bid alternate prices; (3) unit prices; or (4) any combination of items (1) through (3) above.
- D. If the solicitation includes alternate Bid items, failure to bid on the alternates may disqualify the Bid. If Bidding on all items is not required, Bidders should insert the words “no bid” in the space provided for any item on which no price is submitted.
- E. Substitute Bid proposals will not be considered unless this solicitation authorizes their submission.

0.3 BID GUARANTEE

- A. When the sum of the base Bid plus all additive Bid alternates is \$35,000.00 or less, Bid security is not required.

When the sum of the base Bid plus all additive alternates is greater than \$35,000.00, a Bid guarantee in the amount of 5% of the base Bid amount including Washington State Sales Tax (WSST) is required. Failure of the Bidder to provide Bid guarantee when required shall render the Bid non-responsive.

- B. Acceptable forms of Bid guarantee are: A Bid bond on Lake Whatcom Water and Sewer District’s Bid bond form (Section 00310 Bid Bond), or postal money order, or certified check or cashier’s check made payable to Lake Whatcom Water and Sewer District (collectively “Bid Guarantee”).

The Owner will return the Bid Guarantee (other than Bid bond) to unsuccessful Bidders as soon as practicable, but not sooner than the execution of a contract with the successful Bidder. The successful Bidder’s Bid guarantee will be returned to the successful Bidder with its official notice to proceed with the work of the contract.

- C. The Bidder will return to the Owner a signed contract, insurance certificate and bond or bond waiver within 15 days after receipt of the Notice of Award. If the apparent successful Bidder fails to sign all contractual documents or provide the bond and insurance as required or return the documents within 15 days after receipt of the contract, the Owner may terminate the award of the contract and retain the Bid Guarantee.
- D. In the event a Bidder discovers an error in its Bid following the Bid opening, the Bidder may request to withdraw its Bid under the following conditions:

1. Written notification is received by the Owner within 24 hours following Bid opening.
2. The Bidder provides written documentation of the claimed error to the satisfaction of the Owner within three (3) business days following the Bid opening.

The Owner will approve or disapprove the request for withdrawal of the Bid in writing. If the Bidder's request for withdrawal of its Bid is approved, the Bidder will be released from further obligation to the Owner without penalty. If it is disapproved, the Owner may retain the Bidder's Bid Guarantee.

- E. The Bidder shall provide a Bid bond using an industry standard form. To be considered adequate the Bid bond must be signed by Bidder or surety, include Power of Attorney, and be for this project and Bidder.

0.4 ADDITIVE OR DEDUCTIVE BID ITEMS

The low Bidder, for purposes of award, shall be the responsive Bidder offering the low aggregate amount for the base Bid item, plus additive or deductive Bid alternates selected by the Owner, and within funds available for the project.

0.5 ACKNOWLEDGEMENT OF ADDENDA

Bidders shall acknowledge receipt of all addenda to this solicitation by identifying the addenda numbers in the space provided for this purpose on the Bid proposal form. Failure to do so may result in the Bid being declared non-responsive.

0.6 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

The Bidder acknowledges that it has taken steps necessary to ascertain the nature and location of the Work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the Work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and road; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during the Work. The Bidder also acknowledges that it has satisfied itself as to character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including exploratory work done by the Owner, as well as from the drawings and specifications made a part of this Contract. Finally, the Bidder acknowledges that it has become familiar with federal, state and local laws, ordinances, rules, and regulations that may in any manner affect cost, progress or performance of the Work. Any failure of the Bidder to take the actions described and acknowledged in this paragraph will not relieve the Bidder from responsibility for estimating properly the difficulty and cost of successfully performing the Work.

0.7 BID AMOUNTS

- A. The Bid prices shown for each item on the Bid proposal shall include all labor, material, equipment, overhead and compensation to complete all of the work for that item.
- B. The actual cost of building permit, right-of-way revocable encroachment permit, and other local government permits required to complete the project, along with the public utility hookup fees, will be a direct reimbursement to the Contractor or paid directly to the permitting agency by the Owner. Fees for these permits should not be included by the Bidder in the Bid amount.
- C. The Bidder agrees to hold the base Bid and alternate prices open for acceptance by the Owner for sixty (60) days from date of Bid opening.
- D. Unit prices shall not be excessively unbalanced (either above or below the amount of a reasonable Bid) to the potential detriment of the Owner. An unbalanced bid item could render the proposal irregular and constitute grounds for rejection of the Bid.

0.8 TAXES

The Bid amounts shall not include Washington State Sales Tax (WSST). All other taxes imposed by law shall be included in the Bid amount. The Owner will include WSST in progress payments. The Contractor shall pay the WSST to the Department of Revenue and shall furnish proof of payment to the Owner if requested.

[NOTE: Contractor must provide a payment bond pursuant to RCW 39.08.101 in amount of the Contract Sum plus the WSST.]

0.9 SUBMISSION OF BIDS

- A. Bid Proposals must be submitted on or before the time specified in the Advertisement for Bids. All Bids must be made on the Bid Proposal Form, and be accompanied by a Bid Bond or other acceptable Bid Guarantee, along with any supplementary Bid forms. All blank spaces for Bid prices must be filled in with ink or typewritten, and the Bid forms must be fully executed when submitted.
- B. If the base Bid and the sum of the additive alternates is estimated by the Owner to be one million dollars or more, the Bid Proposal shall comply with the following requirements:
 - 1. Pursuant to RCW 39.30.060, if the base Bid and the sum of the additive alternates is one million dollars or more, the Bidder shall provide names of the Subcontractors with whom the Bidder will subcontract for performance of heating, ventilation and air conditioning (HVAC), plumbing, electrical, structural steel installation, and rebar installation.
 - 2. The Bidder can name itself for the performance of the work.

3. The Bidder shall not list more than one Subcontractor for each category of work identified UNLESS Subcontractors vary with Bid alternates, in which case the Bidder must indicate which Subcontractor will be used for which alternate.
 4. Failure of the Bidder to submit as part of the Bid the NAMES of such Subcontractors or to name itself to perform such work shall render the Bidder's Bid nonresponsive and, therefore, void.
- C. The Bid Proposal shall be submitted in a sealed envelope addressed to the office specified in the Advertisement for Bids. The envelope shall have printed on the outside:
1. The project title.
 2. The name and address of the Bidder.
 3. Identification as Bid Proposal.
- D. Prior to the Bid opening, the Owner's representative will designate the official Bid clock. Any part of the Bid proposal or Bid modification not received prior to the times specified, per the designated Bid clock, will not be considered and the Bid will be returned to the Bidder unopened.
- E. A Bid may be withdrawn in person by a Bidder's authorized representative before the opening of the Bids. Bidder(s) representative will be required to show ID and sign on Bid summary sheet before it will be released.

0.10 BID RESULTS

After the Bid Opening, Bidders may obtain Bid results from the District office by calling (360) 734-9224 or by downloading the Bid tabulation from the same location where plans and specifications were posted online as listed in the Advertisement for Bids. Bid results may also be obtained from the A/E.

0.11 LOW RESPONSIBLE BIDDER

- A. Mandatory Responsibility Criteria: Before award of the Contract, a Bidder must meet the following mandatory responsibility criteria under RCW 39.04.350(1) to be considered a responsible Bidder and qualified to be awarded the Contract for this public works project. The Bidder must:
1. At the time of Bid submittal, have a certificate of registration in compliance with chapter 18.27 RCW;
 2. Have a current Washington Unified Business Identifier (UBI) number;
 3. If applicable, have Industrial Insurance (workers' compensation) coverage for the Bidder's employees working in Washington as required in Title 51

RCW; a Washington Employment Security Department number as required in Title 50 RCW; and a Washington Department of Revenue state excise tax registration number as required in Title 82 RCW;

4. Not be disqualified from Bidding on any public works contract under RCW 39.06.010 or 39.12.065(3);
5. If Bidding on a public works project subject to the apprenticeship utilization requirements in RCW 39.04.320, not have been found out of compliance by the Washington State apprenticeship and training council for working apprentices out of ratio, without appropriate supervision, or outside their approved work processes as outlined in their standards of apprenticeship under chapter 49.04 RCW for the one-year period immediately preceding the date of the Bid solicitation;
6. Have received training on the requirements related to public works and prevailing wage in accordance with 39.12 RCW. The bidder must designate a person or persons to be trained on these requirements. The training must be provided by the department of labor and industries or by a training provider whose curriculum is approved by the department. The department, in consultation with the prevailing wage advisory committee, must determine the length of the training. Bidders that have completed three or more public works projects and have had a valid business license in Washington for three or more years are exempt from this subsection. The department of labor and industries must keep records of entities that have satisfied the training requirement or are exempt and make the records available on its web site. Responsible parties may rely on the records made available by the department regarding satisfaction of the training requirement or exemption; and
7. Within the three-year period immediately preceding the date of the bid solicitation, not have been determined by a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW.

- B. Supplemental Responsibility Criteria: In addition to the mandatory Bidder responsibility, the Owner will consider an overall accounting of the attached “DIVISION 00300 SUPPLEMENTAL BIDDER RESPONSIBILITY CRITERIA”.

Following the Bid opening, upon Owner’s request, the apparent low Bidder(s) must supply the information requested in DIVISION 00300 SUPPLEMENTAL BIDDER RESPONSIBILITY CRITERIA, within two (2) business days of request by Owner. Withholding information or failure to submit all the information requested within the time provided shall render the Bid non-responsive.

The Owner will make a determination whether or not the apparent low Bidder is responsible, taking into account all the information submitted by the apparent low Bidder(s) in response to this request. The Owner will notify the Bidder of its determination in writing, including the reasons for its determination.

Within three (3) days after receipt of the determination, if the Bidder is determined not responsible, the Bidder may withdraw its Bid or request an appeal hearing. The Bidder may also present additional information pursuant to RCW 39.04.350 (3)(d).

If the Bidder requests an appeal hearing, the Owner will schedule said hearing at a Board of Commissioner meeting, to be heard not later than two (2) weeks after receipt of Bidder's request. The appeal hearing members will be the Board of Commissioners. The Board will issue a Final Determination after reviewing information presented at the appeal hearing. If the Final Determination affirms that the Bidder is not responsible, the Owner will not execute a Contract for the Project with any other Bidder until two (2) business days after the Bidder determined to be not responsible has received the Final Determination. The Final Determination is specific to this Project, and will have no effect on other or future projects.

- C. Bidders with concerns about the relevancy or restrictiveness of the Supplemental Bidder Responsibility Criteria required in these Bidding Documents may make or submit requests to the Owner to modify the criteria. Such requests should be in writing, describe the nature of the concerns, and proposed specific modifications to the criteria that will make the criteria more relevant or less restrictive of competition. Bidders shall submit any such request seven (7) days prior to the Bid submittal deadline and address the request to the Lake Whatcom Water & Sewer District General Manager.

0.12 "SUBCONTRACTOR RESPONSIBILITY CRITERIA"

- A. In accordance with RCW 39.06.020 the Contractor shall include the language of this section in each of its first tier subcontracts, and shall require each of its subcontractors to include the same language of this section in each of their subcontracts, adjusting only as necessary the terms used for the contracting parties. The requirements of this section apply to all subcontractors regardless of tier.
- B. At the time of subcontract execution, the Contractor shall verify that each of its first tier subcontractors, and a subcontractor of any tier that hires other subcontractors must verify responsibility criteria for each of its subcontractors. Verification shall include that each subcontractor, at the time of subcontract execution, meets the responsibility criteria listed in RCW 39.04.350(1). Subcontractors of any tier shall meet the following Bidder responsibility criteria:
 - 1. Have a current certificate of registration as a contractor in compliance with chapter 18.27 RCW, which must have been in effect at the time of subcontract Bid submittal;

2. Have a current Washington Unified Business Identifier (UBI) number; and if applicable, have:
 - a. Industrial Insurance (workers' compensation) coverage for the subcontractor's employees working in Washington, as required in Title 51 RCW;
 - b. A Washington Employment Security Department number, as required in Title 50 RCW;
 - c. A Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW;
 - d. An electrical contractor license, if required by Chapter 19.28 RCW;
 - e. An elevator contractor license, if required by Chapter 70.87 RCW.
3. Not be disqualified from Bidding on any public works contract under RCW 39.06.010 or 39.12.065(3).
4. Have received training on the requirements related to public works and prevailing wage in 39.12 RCW. The bidder must designate a person or persons to be trained on these requirements. The training must be provided by the department of labor and industries or by a training provider whose curriculum is approved by the department. The department, in consultation with the prevailing wage advisory committee, must determine the length of the training. Bidders that have completed three or more public works projects and have had a valid business license in Washington for three or more years are exempt from this subsection. The department of labor and industries must keep records of entities that have satisfied the training requirement or are exempt and make the records available on its web site. Responsible parties may rely on the records made available by the department regarding satisfaction of the training requirement or exemption.

0.13 CONTRACT AWARD

A. The Owner will evaluate Bids responsiveness and responsibility.

1. A Bid will be considered responsive if it meets the following requirements:
 - a. It is received at the proper time and place.
 - b. It meets the stated requirements of the Bid proposal.
 - c. It is submitted by a licensed/registered contractor within the State of Washington at the time of Bid opening and is not banned from Bidding by the Department of Labor and Industries.

- d. It is accompanied by a Bid Guarantee, if required.
 2. A Bid will be considered responsible if it meets the following requirements:
 - a. It meets the mandatory responsibility criteria established in RCW 39.04.350 and an overall accounting of the supplemental responsibility criteria established for the project.
- B. The Owner reserves the right to accept or reject any or all Bid proposals and to waive informalities or irregularities at its discretion and to accept the Bid which Owner deems to be in its best interest. The lowest Bid will not necessarily be accepted. Without in any way limiting the generality of the foregoing, any Bid may be rejected by Owner in its sole discretion for any of the following reasons:
 1. Incomplete Bid.
 2. Obscured or irregular erasures or corrections.
 3. Prices omitted or unbalanced.
 4. Evidence of inadequate experience of Bidder
 5. Evidence of inadequate capacity of Bidder
 6. Failure to qualify under condition of Bidding Requirements
 7. Evidence of previous failure to adequately perform work
 8. Insertion by Bidder of conditions which vary from the Bidding Requirements or Bid Forms.
- C. No action of the Owner other than a written "Notice of Acceptance," signed by an official properly authorized to execute same by the Owner, shall constitute an acceptance of a Bid.
- D. The apparent low Bidder(s), for purpose of award, shall be the responsive Bidder(s) offering the low aggregate amount for the base Bid plus selected additive or deductive Bid alternates and meeting all other Bid submittal requirements.
- E. **Reciprocal Preference for Resident Contractors.** For a public works bid received from a nonresident contractor from a state that provides an in-state percentage bidding preference, a Comparable Percentage Disadvantage (CPD) will be applied to the bid of that nonresident contractor. The CPD is the in-state contractor percent advantage provided by the contractor's home state.

For the purpose of determining the successful bidder, multiply the nonresident contractor bid amount by the CPD. The "bid amount" shall be the total of the base bid and all accepted alternate bid items. The product of the bid amount multiplied by the CPD shall be the CPD Total. The CPD Total shall be added to the nonresident contractor bid amount which shall equate to the Nonresident Disadvantage Total. The Nonresident Disadvantage Total shall be compared to the Washington contractor bid amounts. The bidder with the lowest total shall be the successful bidder. See example below.

EXAMPLE: Alaska Nonresident Contractor Bid Amount	\$100,000
Multiplied by the Alaska CPD	x 0.05
Alaska CPD Total	\$ 5,000

Alaska Nonresident Contractor Bid Amount	\$100,000
Alaska CPD Total	\$ 5,000
Nonresident Disadvantage Total	\$105,000*

* Note: If the Nonresident Disadvantage Total is lower than all other Washington contractor bid amounts, the Alaska Nonresident Contractor is the successful bidder and will be awarded a contract for the bid amount of \$100,000. If the Nonresident Disadvantage Total is higher than a Washington contractor bid amount, the successful Washington bidder will be awarded a contract for the bid amount.

- F. The Contract will only become effective when signed by both the Contractor and the Owner. Prior to the Owner's signature, any and all costs incurred shall be the sole responsibility of the Bidder.
- G. In the event of a tie low Bid between responsive and responsible Bidders, the Contract will be awarded by random method. The random method will be performed at a District public meeting, where a District commissioner will pull a winner from a hat containing the names of tie Bidders.

0.14 DOCUMENTS (ATTACHED)

- A. Advertisement for Bids
- B. Supplemental Bidder Responsibility Criteria
- C. Bid Bond form
- D. Bid Proposal
- E. Payment Bond form
- F. Performance Bond form
- G. Retainage Bond form
- H. Washington State Prevailing Wage Rates (by reference)
- I. Federal Davis-Bacon Prevailing Wage Rates (by reference)
- J. Water & Sewer Risk Management Pool (WSRMP): Builder's Risk – Hazard Evaluation Guide (FS-01-10) (for projects greater than \$100,000)

SUPPLEMENTAL BIDDER RESPONSIBILITY CRITERIA

Following the Bid opening, upon Owner's request, the apparent low Bidder(s) must supply the requested information as identified herein within two (2) business days of request by Owner. Withholding information or failure to submit all the information requested within the time provided shall render the Bid non-responsive.

The Owner will make a determination whether or not the apparent low Bidder is responsible, taking into account all the information submitted by the apparent low Bidder(s) in response to this request. The Owner will notify the Bidder of its determination in writing, including the reasons for its determination. Within three (3) days after receipt of the determination, if the Bidder is determined not responsible, the Bidder may withdraw its Bid or request an appeal hearing. The Bidder may also present additional information pursuant to RCW 39.04.350 (3)(d). If the Bidder requests an appeal hearing, the Owner will schedule said hearing at a Board of Commissioner meeting, to be heard not later than two (2) weeks after receipt of Bidder's request. The appeal hearing members will be the Board of Commissioners. The Board will issue a Final Determination after reviewing information presented at the appeal hearing. If the Final Determination affirms that the Bidder is not responsible, the Owner will not execute a Contract for the Project with any other Bidder until two (2) business days after the Bidder determined to be not responsible has received the Final Determination. The Final Determination is specific to this Project, and will have no effect on other or future projects.

The following supplemental Bidder responsibility criteria and requested supporting documentation are established for this Project. To be responsible, a Bidder must substantially meet the responsibility criteria established below.

1. Workload Capacity

Current Workload Capacity Criterion:

The Bidder's concurrent and projected workload during the life of this Contract should not exceed 150% of the actual contracted workload over the previous 12 month period unless the Bidder can demonstrate to the Owner's satisfaction that it has the capacity to assume the additional work of this Project, provide adequate staffing, and meet Project demands.

☐ Current Workload
Documentation:

Provide a list of all construction contracts \$100,000 and above your firm has in progress and those projected to commence during the next 9 months, giving the name of project; name, address, and phone number of owner and architect/engineer; contract amount; percentage complete, and scheduled completion date. Failure to list all projects shall render the Bid non-responsive.

List the current and projected workload for the next 12 months including this Contract, expressed in total contract value. \$ _____

List actual contracted workload for the previous 12 months expressed in total contract value.
\$ _____

2. Previous Experience

Previous Experience Criterion:

The Bidder should have experience over the most recent past five (5) years with successfully completing public works projects similar in size and complexity to the current Project. The Contractor's Superintendent and Project Manager should also have experience within the past five (5) years successfully managing to completion public works projects of similar size and complexity to the current Project.

Previous Experience Documentation:

- ☐ Experience of Contractor: Provide a list of public works construction contracts similar in size and complexity your firm has completed in each of the past five (5) years, giving the name of the project, name, address, and phone number of owner, and architect/engineer, contract amount, date of completion, and percentage of the cost of the work performed with your own forces. This information will be used for references.
- ☐ Experience of Superintendent: Submit resume and references of the person proposed by the Bidder to superintend the work. Resume and references should demonstrate Superintendent has managed public works projects of similar complexity and similar size, and successfully completed the project(s) within the last five (5) years.
- ☐ Experience of Project Manager: Submit resume and references of the person proposed by the Bidder to manage the project. Resume and references should demonstrate Project Manager has managed public works projects of similar complexity and similar size, and successfully completed the project(s) within the last five (5) years.

3. Ability to Perform Within Time Specified

Ability to Perform Criterion:

Bidder should have a demonstrable recent track record of completing public works projects on time.

Ability to Perform Documentation:

- Contractor's Ability to Meet the Project Schedule Provide a list of public works construction contracts similar in size and complexity by title, original contract time, and change order time extensions completed within the past five (5) years. Bidders shall document that it achieved substantial completion of these projects of similar size and scope within no more than 105% of the originally allowed contracted duration adjusted for change orders. References and current contact information for owners and architect/engineers on each project listed should be provided

BID BOND

KNOW ALL PEOPLE BY THESE PRESENTS, that _____ the
CONTRACTOR, hereinafter known as PRINCIPAL, and _____ hereinafter
known as SURETY, are held and firmly bound to the Lake Whatcom Water and Sewer District hereinafter known as
OWNER, in the penal sum of _____

_____ dollars (not less than 5% of Base Bid plus Additive Alternates including Washington State Sales Tax) for the payment of which sum well and truly to be made, we do jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns firmly by these presents.

WHEREAS, the PRINCIPAL has submitted a Bid for

(*Project Title*): _____

NOW, THEREFORE, the condition of this obligation is such that if the OWNER accepts the Bid of the PRINCIPAL, and

- a. the PRINCIPAL executes such Contract Documents required by the terms of the Bid and provides required bonds for the performance of the Contract and for the prompt payment of labor and material furnished for the project as may be specified in the Bid then this obligation is satisfied, or
- b. in the event of the failure of the PRINCIPAL to execute such Contract Documents and provide such Bonds required by the terms of the Bid, the PRINCIPAL shall pay and forfeit to the OWNER the full penal sum hereof, then this obligation shall be null and void; otherwise this obligation remains in full force and effect and the SURETY shall forthwith pay and forfeit to the OWNER, as a penalty and liquidated damages, the amount of this bond.

SIGNED, SEALED AND DATED THIS _____ day of _____, 20____.

PRINCIPAL

By

Title

Address of PRINCIPAL

SURETY

By

Title

Address of SURETY

Note: If PRINCIPAL is Partnership, all Partners should execute bond. Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Washington. A power of attorney must be provided which appoints the SURETY's true and lawful attorney-in-fact to make, execute, seal and deliver this bond.

Project Name: LWSD Division 7 Reservoir Replacement Project (District Project #C2111)

Name of Firm: _____

LAKE WHATCOM WATER AND SEWER DISTRICT					
1220 LAKEWAY DRIVE					
BELLINGHAM, WA 98229					
BID PROPOSAL					
In compliance with the contract documents, the following bid proposal is submitted:					
BASE BID					
Item	Description	Quantity	Unit	Unit Price	Amount
1	Mobilization / Demobilization	1	LS	NA	\$
2	Trench Safety Excavation Provisions	1	LS	NA	\$
If the project contains any work which required trenching exceeding a depth of four feet, all costs for trench safety shall be included in the Trench Safety Excavation Provisions lump sum unit price above for adequate trench safety systems in compliance with Chapter 39.04 RCW, 49.17 RCW and WAC 296-155-650. Bidder must include a lump sum dollar amount in blank above (even if the value is \$0.00) to be responsive.					
3	Temporary Traffic Control	1	LS	NA	\$
4	Temporary Erosion and Sediment Control	1	LS	NA	\$
5	Clearing and Grubbing	1	LS	NA	\$
6	Brush and Log Management	1	LS	NA	\$
7	Native Topsoil Salvage, including Stockpiling	1	LS	NA	\$
8	Site Earthwork	1	LS	NA	\$
9	Concrete Water Reservoirs, Foundations, and All Appurtenances	1	LS	NA	\$
10	Site Piping	1	LS	NA	\$
11	Outlet Valve Vault, Standard	1	LS	NA	\$
12	Outlet Valve Vault w/ Seismic Valve and Actuator	1	LS	NA	\$
13	Flow Meter Vault	1	LS	NA	\$
14	Electrical, Telemetry & Instrumentation	1	LS	NA	\$
15	Steel Reservoir Demolition	1	LS	NA	\$
16	Site and Surface Restoration	1	LS	NA	\$
17	Project Mitigation Site Preparation and Planting	1	LS	NA	\$
18	Miscellaneous Owner Directed Work	1	LS	NA	\$ 20,000
19	Construction Records	1	LS	NA	\$
20	Build America, Buy America Act (BABAA) Compliance (Section 01 02 50 Scopes of Bids)	1	LS	NA	\$
21	Unscheduled Rock Excavation requiring Special Equipment, including Stockpiling and/or Haul	760	CY	\$	\$
22	Unscheduled Unsuitable Foundation Over-Excavation	20	CY	\$	\$
23	Unscheduled Additional Crushed Surfacing Base Course	50	TON	\$	\$
TOTAL BASE BID (Sum of Bid Items 1 - 23) \$					
(do not include Washington State Sales Tax)					

Project Name: LWWS Division 7 Reservoir Replacement Project (District Project #C2111)

Name of Firm: _____

Subcontractor Listing

RCW 39.30.060 Requirement. Lake Whatcom Water and Sewer District has estimated that the Base Bid and the sum of the additive alternates is one million dollars or more. Bidder shall comply with RCW 39.30.060 and provide names of the Subcontractors with whom the Bidder will directly subcontract for performance of the following Work. If the Bidder intends to self-perform the Work itself, the Bidder must enter its name for that category of Work.

The Bidder shall not list more than one Subcontractor for each category of Work identified UNLESS Subcontractors vary with Bid alternates, in which case the Bidder must indicate which Subcontractor will be used for which alternate.

Bidder's compliance with RCW 39.30.060 must be met, irrespective of listing of subcontractors on this Bid Proposal Form, for a Bidder to be determined Responsive.

Designated Work

Firm Name

Heating Ventilation Air Conditioning (HVAC):

☐ Check this box if project does NOT include any HVAC work. Otherwise fill in the name of the firm performing HVAC work in line above.

☐ Check this box if Bidder intends to submit the name of the subcontractor with whom the Bidder, if awarded the contract, will subcontract for performance of this work, within ONE (1) HOUR of the published bid submittal time.

Plumbing:

☐ Check this box if project does NOT include any plumbing work. Otherwise fill in the name of the firm performing plumbing work in line above.

☐ Check this box if Bidder intends to submit the name of the subcontractor with whom the Bidder, if awarded the contract, will subcontract for performance of this work, within ONE (1) HOUR of the published bid submittal time.

Electrical

High Voltage:

☐ Check this box if project does NOT include any high voltage electrical work. Otherwise fill in the name of the firm performing high voltage electrical work in line above.

☐ Check this box if Bidder intends to submit the name of the subcontractor with whom the Bidder, if awarded the contract, will subcontract for performance of this work, within ONE (1) HOUR of the published bid submittal time.

Project Name: LWWSD Division 7 Reservoir Replacement Project (District Project #C2111)

Name of Firm: _____

Low Voltage:

☐ Check this box if project does NOT include any low voltage electrical work. Otherwise fill in the name of the firm performing low voltage electrical work in line above. .

☐ Check this box if Bidder intends to submit the name of the subcontractor with whom the Bidder, if awarded the contract, will subcontract for performance of this work, within ONE (1) HOUR of the published bid submittal time.

Structural Steel Installation:

☐ Check this box if project does NOT include any structural steel installation work. Otherwise fill in the name of the firm performing plumbing work in line above.

☐ Check this box if Bidder intends to submit the name of the subcontractor with whom the Bidder, if awarded the contract, will subcontract for performance of this work, within FORTY EIGHT (48) HOURS of the published bid submittal time.

Rebar Installation:

☐ Check this box if project does NOT include any rebar installation work. Otherwise fill in the name of the firm performing plumbing work in line above.

☐ Check this box if Bidder intends to submit the name of the subcontractor with whom the Bidder, if awarded the contract, will subcontract for performance of this work, within FORTY EIGHT (48) HOURS of the published bid submittal time.

If applicable, Alternate Bid Item # _____ Subcontractors:

(Bidder may attach a separate sheet for additional alternate Bid Subcontractors.)

Alternate Bid Item # _____ HVAC: _____

Alternate Bid Item # _____ Plumbing: _____

Alternate Bid Item # _____ High Voltage Electrical: _____

Alternate Bid Item # _____ Low Voltage Electrical: _____

Alternate Bid Item # _____ Structural Steel Installation: _____

Alternate Bid Item # _____ Rebar Installation: _____

☐ Check this box if Bidder intends to submit the name of the subcontractor(s) with whom the Bidder, if awarded the contract, will subcontract for performance of this work, within the required time of the published bid submittal time, per RCW 39.30.060.

Project Name: LWWS Division 7 Reservoir Replacement Project (District Project #C2111)

Name of Firm: _____

The Contractor shall provide, for Owner's information and approval, the name of the Control System Integrator (Section 28 90 00).

Designated Work

Firm Name

Control System Integrator _____ The
Owner reserves the right to accept or reject any or all Bid prices within sixty (60) days of the Bid date.

Time for Completion

The undersigned hereby agrees to substantially complete all the Work (and accepted alternates) by **August 1, 2025**; and to achieve Final Completion by **September 30, 2025**.

*****Work Window Limitation***** Seasonal clearing activity limitations established by Whatcom County Code 20.51.410 are in force. Clearing activity, which includes trench excavation/backfill and other land disturbance, that will result in exposed soils exceeding 500 square feet are not permitted from October 1 through May 31. Whatcom County measures the total project land disturbance area to determine the square footage threshold, not individual work sites or sequential trenching/backfill. **To meet this requirement the contractor must complete all excavation and land disturbance activities on the project between May 31 and October 1, except for the last 500 square feet.**

Liquidated Damages

The undersigned agrees to pay the Owner as liquidated damages the sum as specified in the General Conditions for each consecutive calendar Day that is in default after the Contract Time(s). Liquidated damages shall be deducted from the contract by Change Order or from the Contractor's application for payment as determined by Owner in its sole discretion.

Receipt of Addenda

Receipt of the following addenda is acknowledged:

Addendum No. _____	Addendum No. _____	Addendum No. _____
Addendum No. _____	Addendum No. _____	Addendum No. _____

Federal Davis-Bacon Act and State of Washington Prevailing Wage Requirements

Contractor is required to pay the higher of the Federal Davis-Bacon Act and Washington State Prevailing Wages.

Applicable Federal Davis-Bacon Act Wage Decision
See Section 00700, Section 00800, and Appendix B.

Applicable Prevailing Wage Rates

State of Washington prevailing wage rates for this public works project located in Whatcom County may be found at the following website address of the Department of Labor and Industries: <https://lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-rates/> Based on the Bid submittal deadline for this project, the applicable effective date for prevailing wages for this project is **February 27, 2024**. A copy of the applicable prevailing wage rates are also available for viewing at the office of the Owner, located at 1220 Lakeway Driv

Project Name: LWWSD Division 7 Reservoir Replacement Project (District Project #C2111)

Name of Firm: _____

e, Bellingham, Washington. Upon request, the Owner will mail a hard copy of the applicable prevailing wages for this project.

Bid Submittal Checklist

- _____ 00410 Bid Proposal (this form)
- _____ Bid Guarantee (00310 Bid Bond or other type of Bid Guarantee)
- _____ Certification of Nonsegregated Facilities (Attached immediately following 00410 Bid Proposal)
- _____ EPA Form 6100-3 DBE Program Subcontractor Performance Form (Attached immediately following 00410 Bid Proposal) for all DBE subcontractors.
- _____ EPA Form 6100-4 DBE Program Subcontractor Utilization Form (Attached immediately following 00410 Bid Proposal)
- _____ Complete Bidders List (as described in 00800 Supplemental Conditions, item 16, page 4 of 4)
- _____ Byrd Anti-Lobbying Certification Form

Project Name: LWWS Division 7 Reservoir Replacement Project (District Project #C2111)

Name of Firm: _____

Name of Firm _____

Non-Collusion Declaration: By signing below, I hereby declare that I, firm, association or corporation has (have) not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action restraining free competitive bidding for this project.

In addition, by signing below I hereby declare that: Within the three-year period immediately preceding the date of the bid solicitation, I, firm, association or corporation has (have) not have been determined by a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW.

I certify under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct.

Check One: Sole Proprietorship ☐ Partnership ☐ Joint Venture ☐ Corporation ☐

State of Incorporation, or if not a corporation, State where business entity was formed:

If a co-partnership, give firm name under which business is transacted:

Signed by _____, Official Capacity _____

Print Name _____

Date of Execution _____

Place of Execution _____

** If a corporation, proposal must be executed in the corporate name by the president or vice-president (or any other corporate officer accompanied by evidence of authority to sign). If a co-partnership, proposal must be executed by a partner.*

Address _____

City _____ State _____ Zip Code _____

Telephone _____ FAX _____

State of Washington Contractor's License No. _____

Federal Tax ID # _____ e-mail address: _____

Employment Security Department No. _____

CERTIFICATION OF NONSEGREGATED FACILITIES

(Applicable to federally assisted construction contracts and related subcontracts exceeding \$10,000 which are not exempt from the Equal Opportunity clause.)

The federally assisted construction contractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor certifies, further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work area, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or area, in fact, segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The federally assisted construction contractor agrees that (except where he has obtained identical certifications from proposed contractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause, and that he will retain such, certification in this file.

Signature

Date

Name and title of signer (please type)

[THIS FORM SHALL BE COMPLETED IN FULL AND SUBMITTED WITH THE BID PROPOSAL]

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Performance Form

This form is intended to capture the DBE¹ subcontractor's² description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractors bid or proposal package.

Subcontractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services , Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: <input type="checkbox"/> DOT <input type="checkbox"/> SBA <input type="checkbox"/> Other: _____		Meets/ exceeds EPA certification standards? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Unknown

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

Subcontractor Signature	Print Name
Title	Date

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE¹ subcontractors² and the estimated dollar amount of each subcontract. An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Issuing/Funding Entity:			

I have identified potential DBE certified subcontractors	___ YES	___ NO	
If yes, please complete the table below. If no, please explain:			
Subcontractor Name/ Company Name	Company Address/ Phone/ Email	Est. Dollar Amt	Currently DBE Certified?

Continue on back if needed

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION

(To be submitted with each bid or offer exceeding \$100,000)

The undersigned, [Company] _____ certifies, to the best of his or her knowledge, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor, [Company] _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 *et seq.*, apply to this certification and disclosure, if any.

Please check the appropriate box:

_____ No non-federal funds have been used or are planned to be used for lobbying in connection with this application/award/contract.

or

_____ Attached is Standard Form LLL, "Disclosure of Lobbying Activities," which describes the use (past or planned) of non-federal funds for lobbying in connection with this application/award/contract.

Executed this _____ day of _____, 20 _____

By: _____

(Type or Print Name) (Title of Executing Official)

(Signature of Executing Official) (Name of Organization/Applicant)

PART 2

CONTRACTING REQUIREMENTS

AGREEMENT

THIS AGREEMENT is made and entered into at Bellingham, Washington, this _____ day of _____, **2024**, by and between Lake Whatcom Water and Sewer District, hereinafter designated as the OWNER, and

_____ hereinafter designated as the CONTRACTOR. It is made with reference to the following facts:

1. OWNER has heretofore caused to be prepared "Contract Documents," as defined in the General Conditions, which documents include without limitation this Agreement, Bidding Requirements, Contracting Requirements, Technical Specifications, Miscellaneous Documents and Plans for the construction of the

(Project Title): **LWWSD Division 7 Reservoir Replacement Project (District Project #C2111)**

2. CONTRACTOR filed with the OWNER on _____, **2024**, a proposal to complete said Work.
3. Contractor agreed to accept as payment thereof the sum fully stated and set forth in the Proposal and Board approved bid alternate(s).
4. The Contract Documents fully and accurately describe the terms and conditions upon which the CONTRACTOR proposed to furnish said equipment, labor, material and appurtenances and perform said Work, together with the manner and time of furnishing same.

IT IS THEREFORE AGREED, that the Contract Documents identified above are fully incorporated by referenced into this Agreement.

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

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

CONTRACTOR:

By: _____

Name: _____

Title: _____

ATTEST: _____

Name: _____

Title: _____

OWNER: LAKE WHATCOM WATER &
SEWER DISTRICT

By: _____

Name: Justin Clary, PE, General Manager

ATTEST: _____

Name: _____

Title: _____

WATER & SEWER RISK MANAGEMENT POOL

[WSRMP]

INSURING WASHINGTON'S WATER AND SEWER UTILITIES SINCE 1987

Builder's Risk - Hazard Evaluation Guide for Projects > \$100,000

(FS-01-10)

How to Use this Guide

Best risk management practice indicates that Districts and their project management representatives should require contractor's awarded a project to submit a written site specific loss control plan (SSLCP) for projects with a constructed value of \$100,000 or greater. Builder's Risk hazard risk control procedures must be included in each contractor's loss prevention plan and submitted for review by the District. Districts are provided Builders Risk insurance through WSRMP which puts them in a much better negotiating position to contractually require that best practices be followed to control Builders Risk exposures. This guide can be used by member Districts to evaluate whether each element is covered in the general contractor's document submittals.

If a member District does not have such a Builder's Risk checklist they may want to provide the Prime Contractor a copy of the attached checklist after bid award to help the Prime Contractor know what the District expects should be in a good SSLCP.

If a SSLCP is included by reference as part of the construction contract then during the course of construction, when deviations occur from the loss control plan the owner is not directing the construction work but is only enforcing the contract.



If you have further questions about Builders Risk and Course of Construction Risk Management please call WSRMP at 425-452-9750 or email larryb@wsrmp.org

Builders' Risk (FS-01-10)

(Course of Construction Loss Control Guidance on Preparation of Site-Specific Loss Control Plans)

Introduction

This guide was prepared for building construction and other structures, during the course of construction, including the planning, site preparation, and erection/installation periods. Its focus includes loss prevention suggestions in the areas of management practices, fire and engineering planning, site security, off-site security, and construction practices. It is designed to consider property damage exposures rather than employee or public safety.

Structures in the course of construction are susceptible to substantial loss. Many of these losses, not including damage caused by environmental causes, could and should be prevented through management attention to the areas contained in this guide.

The topics covered in this document are intended to provide an overall awareness of the major exposures and hazards associated with District member construction risks. It is not possible to treat any of these subjects in an exhaustive manner. While the information and recommendations provided cannot guarantee a loss free environment, they should contribute to the control of losses. Adapt these guidelines to project requirements and site-specific conditions.

SITE SECURITY

General Premises Protection and Control

- a) Develop job site security plan and assign security responsibilities.
- b) Contact police authorities and solicit aid of neighbors to watch site.
- c) Require reports of theft and vandalism and maintain complete records thereof.
- d) Encourage employees to suggest and assist in solving problems.
- e) Consider utilizing a reputable security service with communication equipment to minimize incidence of fire, theft and vandalism.
- f) Include security staff representatives as part of pre-construction and emergency planning meetings.

Theft and Vandalism

- a) Enclose job site with an eight-foot chain link fence. If fencing is not practical, establish a fenced, well-lighted compound on the site for containment of essentials such as equipment and building materials, as well as the construction trailer.
- b) Provide adequate but limited access with locking gates. Have a construction trailer at gate.
- c) Locks should be of high quality and should remain locked at all times. Keys should be accessible only to appropriate personnel.
- d) Check out site before leaving for the day.
- e) Provide elevated nighttime lighting.
- f) Utilize around the clock security guards.
- g) Install alarm systems on trailers and storage sheds.

Equipment, Tools and Materials

- a) Establish an inventory control program and check out system for tools and material.
- b) Mark all tools and materials in distinctive manner.



- c) Lock all equipment cabs during non-working hours, and monitor key control program.
- d) Disable equipment by removing battery, distributor cap or rotor, chain equipment together, and position mobile equipment to block vulnerable items. Lock oil, gas and hydraulic caps.
- e) Secure tools in locked storage shed or trailer.
- f) Make one person responsible to sign for deliveries or materials and verify same.
- g) Keep inventory of materials to a minimum and store away from perimeter fencing.
- h) Control on site parking in designated areas to necessary vehicles and locate employee-parking remote from job site fence.

Security Service

- a) Determine level of protection required by location, exposure to natural perils, and nature of on-site exposures.
- b) Specify requirements to professional security service provider.
- c) Consider these elements of security service:
 - i. Site ingress and egress.
 - ii. Local and remote control reporting.
 - iii. Site Patrolling.
 - iv. Requirements during all types of emergency plans, including use and activation of emergency equipment.
 - v. Quality of on-site communications.
 - vi. Quality of off-site communications for public fire and police assistance.
 - vii. Knowledge and experience of service for type of construction.
- d) Identify authority level of security service. All contractors on the site should understand such authority.

OFF-SITE SECURITY

Storage Yards and Lots

- a) Provide adequate lighting, fencing, and watchmen service and/or camera supervision.

- b) Do not store machinery and materials of high value or any property susceptible to damage by weather conditions at these off-site locations.
- c) Avoid areas subject to flooding, earth slide and other natural perils.

Assembly Locations

- a) Select reputable contractor when off-site assembly of machinery/equipment is required and obtain certificates of insurance from the contractor.
- b) Pre-plan and coordinate off-site assembly of required items to maximize workflow procedures and minimize storage exposures.

Warehouses

- a) Arrange purchasing/delivery to minimize need for prolonged storage periods.
- b) Maintain effective inventory procedures for checking items received and removed from storage.
- c) Provide adequate physical protection and controls against loss by fire, theft and vandalism.
- d) Develop a fire prevention program that includes both private and public protection.
- e) Ensure storage arrangements conform to applicable standards and maintain adequate access.
- f) When a public warehouse facility is used, it should be reputable, financially responsible and in good physical condition with adequate protection.
- g) Identify acceptable warehouse locations during preplanning process to facilitate selection if need arises.

Transit

- a) Ensure proper equipment used for transporting property (e.g. low boys, flat beds, and vans).
- b) Pre-plan route to avoid low overpasses, bridges with weight restrictions, etc.

- c) Schedule delivery to job site to minimize storage exposures prior to installation.
- d) Comply with special regulations and practices when transporting wide loads.
- e) Secure items properly for transit and protect them from the weather.
- f) Avoid overnight runs with unattended parking exposures whenever possible.
- g) Avoid temporary dropping of trailer with load outside actual job site.
- h) Arrange delivery at job site when designated personnel are available to accept load.
- i) Assure proper handling equipment at job site for safe unloading upon arrival.
- j) Assure adequate access to job site (e.g.: clearance of streets and overheads, stability of ground ramps).
- k) Inspect load and sign bill of lading upon receipt from carrier noting any shortages or damages.
- l) Determine who has title to property in transit to avoid disputes after a loss.

HOISTING AND RIGGING

- a) When hoisting or rigging is necessary, use a licensed, capable rigger and obtain certificates of insurance from the rigger.
- b) Follow the manufacturers' recommended procedures when loading/unloading equipment and materials.
- c) Engineer all critical loads to be hoisted. Do not rely on invoice weights, when accurate weights are critical to the hoist.

FIRE PROTECTION / HAZARD PREVENTION

The potential for serious fire damage is often greater during the course of construction than after the building is completed. The lack of fire proofing on structural members, lack of cut offs, accumulations of combustibles, temporary heat and hot processes, coupled with incomplete fire protection systems such as alarms, standpipes and sprinklers create this vulnerability.

The following guidelines will help reduce the potential of a fire during construction and will help to provide a framework for fire control should a fire occur.

Management Responsibilities

- a) Establish accountability AND responsibilities.
- b) Implement prevention/protection programs.

Fire Prevention

- a) Organize safe storage of materials.
- b) Remove packing materials, combustible form work and other trash regularly. Do not allow trash to accumulate on the site.
- c) Welding and cutting operations should be conducted safely, away from combustible materials. A fire watch should be posted in the area during operations and for 30 minutes after hot work is completed. Protect exposed, immovable combustibles.
- d) Tar kettles should be located outside the building, safely away from combustibles.
- e) Temporary heat should be provided by UL listed equipment, which is properly installed. Bonfires and drum fires should be prohibited.
- f) Spare gas cylinders should be stored upright with valve cover in place. Cylinders should be stored in a cool area and should be secured to prevent tipping.
- g) Fuel gases should be stored away from oxidizing gases.
- h) Flammable liquids should be limited in quantity to that necessary for operations. Bulk storage should be in stable, diked tanks or properly marked safety cans located away from source of ignition and physical damage.
- i) Only flame resistant tarpaulins should be used.
- j) Temporary offices and tool sheds should be located outside the building. If such structures are erected inside the building, construction should be of non-combustible material and sprinkler protection should be provided.
- k) Temporary electrical service and circuits should be installed in accordance with the National Electrical Code.
- l) Temporary heating devices such as LPG fueled jet heaters should be UL listed and located a safe distance from any combustible materials.

Public Protection

- a) Job site access for fire department usage, including access to all sides of the structure should be provided and maintained throughout the period of construction.
- b) Water supply should be adequate, reliable and accessible for all areas of the job site. Notify proper authority as soon as fire hydrants, standpipes or similar devices become available so they can inspect and test as appropriate.
- c) Fire protection systems should be expedited and should be with hose connection completed and placed in service on each floor as early as possible during construction.
- d) Temporary sprinkler system should be provided in areas where hazards warrant.
- e) For high-rise buildings, extend a serviceable standpipe up and provide at least one 2 1/2" hose outlet on each floor. Locate top hose outlet not more than one floor below the highest area containing combustibles. Provide a readily accessible fire department connection outside at street level.
- f) Properly maintained fire extinguishers should be provided in all office sheds, tool sheds, etc., and on each floor of the building.
- g) Security services should be provided during all idle hours. Security guards should patrol the construction site regularly and should record rounds on a watch clock.
- h) Provide communication capabilities with the public fire department.
- i) Fire walls protecting horizontal and vertical openings should be completed as early as possible during construction.
- j) An emergency organizational plan should be established to call the fire department, implement fire fighting measures, and take action to limit the damage should a fire occur. Furnish site plan to fire department showing access points to the site and critical storage areas, such as flammable liquids and solids.
- k) Arrange periodic on-site visits by fire department.

CONSTRUCTION PRACTICES

Consideration of the types, methods and features of construction are significant aids in evaluating the loss potential of builder's risks. The many practices must be compatible and complementary to minimize or avoid loss, always bearing in mind that changes in design should be approved by the design engineer and project manager. Offered here are some guidelines to help control this exposure.

COMPONENT CONSIDERATIONS

To properly evaluate the general exposure to any structure, one should evaluate the key components that make up the project, e.g. foundation, frame, roof. It may be desirable to employ specialists, e.g. special rigging, post tensioning or specialized concrete placement. Bear in mind that soil and foundation engineers are not always used. During all phases of construction and development, supervision by specialized, experienced engineers and contractors is critical to assure proper communication and continuity of design.

Foundations

Hazard: Improper design or workmanship can result in abnormal settlement, which can affect the integrity of the completed structure.
Suggestion: In more complex foundation situations, utilize test piles to verify capability. Maintain adequate de-watering capability (especially in deeper foundations or cast in place piles or caissons). Require contractor to report unusual soil conditions from the expected, especially compressible soils or voids.

Structural Support

Hazard: Improperly erected structural support can result in extensive repairs or even total collapse of the structure.
Suggestion: The design engineer should be represented at the site in order to assure the contractor's understanding of the

construction details such as expansion joints, erection sequence, and temporary support requirements. Utilize specialist contractors as necessary.

Facades

Hazard: Improperly constructed facades can result in personal hazard (falling objects) as well as threaten the water, weather and insulation integrity of the building.

Suggestion: It is essential that a qualified specialist contractor be utilized as well as any specialized erection guidance.

Roof Structures

Hazard: Failure of roof systems to maintain water integrity as well as load capability can result in water damage to interiors as well as collapse.

Suggestion: Inspections should include tests for adequate expansion as well as water removal capability (to avoid pounding).

TECHNIQUES AND TYPES OF CONSTRUCTION

Contractors use a variety of techniques to perform the various types of construction required by building designers. While the type of structure will determine the basic material (e.g. concrete, reinforced concrete, and structural steel), the contractor often has a number of options in choosing the respective technique. In order to avoid these hazards of specialized work, it is recommended that only experienced, specialized contractors be used. Some of these techniques and their considerations are:

Concrete Placement

Hazard: Improperly placed or poor quality concrete can often result in a member that is structurally weak or overstressed (excessive shrinkage). This can lead to extensive remedial repairs or catastrophic collapse of an entire structure.

Suggestion: Require independent inspection of incoming concrete as well as observation

of contractor placement. Additional tests of samples should be made to verify ultimate strength. Pouring sequence should be arranged to minimize setting shrinkage of the overall member and assembly. Shoring equipment should have a safety factor based on accepted testing procedures. During and after the pour, there should be continuous inspection of the shoring system so that any movements can be adjusted immediately.

Flying Forms

Hazard: Aside from the damage, which may occur to the forms themselves during the moving operation, the major concern is the collapse hazard. This can result, either from the removal of the forms before proper curing of the concrete or the structural failure of the flying forms themselves.

Suggestion: The forms should be designed for the specific job and the manufacturer's specification should be followed in the assembly and pouring of the concrete within designated safe capacities. Recommended capacities are for new equipment, therefore, after each concrete placement, all parts of the forms should be inspected and any dents, cracks, broken welds, etc., should be repaired or the part replaced.

Tilt-Up and Precast Wall Construction

Hazard: Usual rigging exposures when panels are lifted into place. Until the roof is in place, there is a critical period when the walls are highly susceptible to wind or other accidental damage.

Suggestion: Properly approved and engineered rigging plans should be drawn and not altered without the engineer's approval. Once in place, panels must be properly braced against wind or lateral movement. Temporary bracing should be carefully designed, recognizing not only the normal wind factors for the area, but also allowing for unexpected high winds which could be encountered. Construction of the bracing should follow manufacturer's recommendations and be closely supervised.

Slurry Wall Excavation

Hazard: This technique can result in collapse or ground sliding when improperly performed.

Suggestion: Utilize only experienced specialist contractors for this work.

Other Techniques Which Require Specialized Contractor Experience

Slip Forming
Jump Forming
Post Tensioning

Fast Track Construction

Hazard: Changes to design during construction, which are not properly coordinated, can cause damage or even structural collapse.

Suggestion: Require continuous monitoring of construction as well as changes by the design engineers to assure proper communication as well as continuity of design.

CONTRACTOR DESIGN/BUILD EXPERIENCE

Since all design work is not done by the architect/engineer, some additional considerations are:

Reinforced Concrete

Hazard: Improper design of form work causing collapse of uncured concrete. Also there is the possibility of collapse due to improper detailing of reinforcing steel.

Suggestion: Require contractor qualification or require subcontract to qualified specialty contractor.

Cofferdam/Retaining Wall

Hazard: Collapse due to improper design.

Suggestion: Have specialized and detailed design reviewed by project design engineer.

Rigging Design

Hazard: Damage due to collapse of component or system during specialized rigging operations.

Suggestion: Require design engineers to review critical work (rigging plans) as well as utilize specialized, experienced and qualified contractor.

NATURAL PERILS

Earthquake

Refer to applicable building codes to determine seismic zone (0, 1, 2, 3, 4,) and anticipated earthquake intensity, if any, for the location.

Identify any fault, fault length, date and maximum magnitude of a seismic event. Also check seismic history for frequency of events.

Consider pre-construction site conditions determined that could be affected by seismic activity.

- a. Terrain: Topography of land, bodies of water.
- b. Geologic formation and soil conditions: bedrock type, thickness and type of overburden, water table, filled ground.
- c. Ground site response: compaction, landslides, liquefaction, uplift or displacement along a fault.

Emergency plans in event of seismic activity should include: availability of cranes, site protection, utilities outages, vandalism and theft protection, and transportation of injured to nearest hospital clinic or aid station. Construction in known seismic zones should conform to that zone's requirements and should be verifiable through the architect's/engineer's plans and specifications.

Flood

Determine if location is in 100-year flood plain. On line resources are available to estimate flood zones.

Consider local site conditions that could induce flash flooding such as: up-slope exposures, gullies, washes, dams, reservoirs, water impoundment on site or adjacent site, existing drainage facilities for overloading by flash flooding or unusual rains.

Make chronological inventory of materials, building equipment installed and to be installed, construction equipment and electrical facilities.

Establish plan to monitor weather forecasts 24 hours per day to identify need to move equipment or materials to higher elevations or safer locations.

Windstorm

Determine meteorological history of the area including known losses.

Check for local prevailing winds and phenomena. Even low winds can cause damage to partially completed structures such as framing, unsupported masonry, and tilt up construction. Gusts can be twice the prevailing wind speeds.

Unprotected and unsecured materials are particularly vulnerable.

Establish plan to monitor weather forecasts 24 hours per day to identify need to install extra bracing or supports, and provide better protection for equipment or materials susceptible to windstorm damage.

PERFORMANCE BOND

KNOW ALL PEOPLE BY THESE PRESENTS, that _____ the

CONTRACTOR, hereinafter known as PRINCIPAL, and _____ hereinafter known as SURETY, are held and firmly bound to the Lake Whatcom Water and Sewer District hereinafter known as

OWNER, in the penal sum of _____

_____ dollars (including Washington State Sales Tax) for the payment of which sum well and truly to be made, we do jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the PRINCIPAL entered into a Contract

with the OWNER dated the _____ day of _____, 20____ to construct the

(Project Title): _____, and which Agreement is on file at the OWNER's office and by this reference is made a part hereof.

WHEREAS, said PRINCIPAL is required under the terms of said Agreement to furnish a bond for the faithful **performance** of said Agreement:

NOW, THEREFORE, if the Principal shall well, truly, and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received agrees that no change, extension of time, alteration or addition to the terms of the Contract, the SPECIFICATIONS accompanying the Contract, or to the WORK to be performed under the Contract shall in any way affect its obligation on this BOND, and waives notice of any change, extension of time, alteration or addition to the terms of the Contract or the WORK performed. The Surety agrees that modifications and changes to the terms and conditions of the Contract that increase the total amount to be paid the Principal shall automatically increase the obligation of the Surety on this BOND and notice to Surety is not required for such increased obligation.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, the duly authorized officers of PRINCIPAL and of SURETY execute this instrument in three counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20____.

PRINCIPAL

By

Title

Address of PRINCIPAL

SURETY

By

Title

Address of SURETY

Note: Date of Bond must not be prior to date of Contract. If PRINCIPAL is a Partnership, all Partners should execute bond. Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Washington. A power of attorney must be provided which appoints the SURETY's true and lawful attorney-in-fact to make, execute, seal and deliver this bond.

PAYMENT BOND

KNOW ALL PEOPLE BY THESE PRESENTS, that _____ the

CONTRACTOR, hereinafter known as PRINCIPAL, and _____ hereinafter known as SURETY, are held and firmly bound to the Lake Whatcom Water and Sewer District hereinafter known as

OWNER, in the penal sum of _____

_____ dollars (including Washington State Sales Tax) for the payment of which sum well and truly to be made, we do jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the PRINCIPAL entered into a Contract

with the OWNER dated the _____ day of _____, 20____ to construct the

(Project Title): _____, and which Agreement is on file at the OWNER's office and by this reference is made a part hereof.

WHEREAS, said PRINCIPAL is required under the terms of said Agreement to furnish a bond for the faithful **payment** of all laborers, mechanics, subcontractors, materialmen and all persons who shall supply said Principal or said subcontractors with provisions and supplies for the carrying on of work under said Contract:

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said Contract and pay all laborers, mechanics, subcontractors, materialmen and all persons who shall supply said Principal or said subcontractors with provisions and supplies for the carrying on of such work during the original term of said Contract and any extension thereof that may be granted by the Lake Whatcom Water and Sewer District, and during the life of any guaranty required under the Contract and shall well and truly perform and fulfill the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said Contract and pay all laborers, mechanics, subcontractors, materialmen and all persons who supply said Principal or said subcontractors with provisions and supplies for the carrying on of such modifications which may hereafter be made, then this obligation to be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received agrees that no change, extension of time, alteration or addition to the terms of the Contract, the SPECIFICATIONS accompanying the Contract, or to the WORK to be performed under the Contract shall in any way affect its obligation on this BOND, and waives notice of any change, extension of time, alteration or addition to the terms of the Contract or the WORK performed. The Surety agrees that modifications and changes to the terms and conditions of the Contract that increase the total amount to be paid the Principal shall automatically increase the obligation of the Surety on this BOND and notice to Surety is not required for such increased obligation.

PROVIDED, FURTHER, this Bond is executed pursuant to RCW Chapter 39.08.

IN WITNESS WHEREOF, the duly authorized officers of PRINCIPAL and of SURETY execute this instrument in three counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20____.

PRINCIPAL

By

Title

Address of PRINCIPAL

SURETY

By

Title

Address of SURETY

Note: Date of Bond must not be prior to date of Contract. If PRINCIPAL is a Partnership, all Partners should execute bond. Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Washington. A power of attorney must be provided which appoints the SURETY's true and lawful attorney-in-fact to make, execute, seal and deliver this bond.

RETAINAGE BOND

KNOW ALL PEOPLE BY THESE PRESENTS, that _____ the
CONTRACTOR, hereinafter known as PRINCIPAL, and _____ hereinafter
known as SURETY, are held and firmly bound Lake Whatcom Water and Sewer District hereinafter known as
OWNER and the State of Washington (STATE), and are similarly held and bound unto the beneficiaries of the trust
fund created by Chapter 60.28 Revised Code of Washington (RCW), and their heirs, executors, administrators,
successors and assigns in the penal sum of _____

dollars, plus 5% of any increases in the Contract Sum that have occurred or may occur, due to change orders, increases
in the quantities or the addition of any new item of work.

WHEREAS, the PRINCIPAL has executed Contract for

(Project Title): _____

WHEREAS, said Contract and Chapter 60.28 RCW require the OWNER to withhold from the PRINCIPAL the sum
of five percent (5%) from monies earned by the PRINCIPAL on estimates during the progress of the Work, hereinafter
referred to as earned retained funds; and

WHEREAS, the PRINCIPAL/SURETY has requested that the OWNER accept a bond in lieu of earned retained funds
as allowed under Chapter 60.28 RCW.

NOW, THEREFORE, this obligation is such that the SURETY, its successors and assigns, are held and bound unto
OWNER, STATE and unto all beneficiaries of the trust fund created by RCW 60.28.011(1) in the aforesaid sum. This
bond, including any proceeds therefrom, is subject to all claims and liens and in the same manner and priority as set
forth for retained percentages in Chapter 60.28 RCW. The condition of this obligation is such that if the PRINCIPAL
shall satisfy all payment obligations to persons who may lawfully claim under the trust fund created pursuant to
Chapter 60.28 RCW, to the STATE, and to the OWNER, and indemnify and hold the OWNER harmless from any
and all loss, costs, and damages that the OWNER may sustain by release of said retainage to PRINCIPAL/SURETY,
then this obligation shall be null and void provided the SURETY is notified by OWNER that the requirements of
RCW 60.28.021 have been satisfied and the obligation is duly released by OWNER; otherwise it shall remain in full
force and effect.

IT IS HEREBY FURTHER DECLARED AND AGREED that this obligation shall be binding upon and inure to the
benefit of the PRINCIPAL, the SURETY, the OWNER, STATE and, the beneficiaries of the trust fund created by
Chapter 60.28, Revised Code of Washington (RCW) and their respective heirs, executors, administrators, successors
and assigns.

The laws of the State of Washington shall be applicable in the determination of the rights and obligations of the parties
hereunder. Venue for any dispute or claim hereunder shall be the superior court of Whatcom County.

SIGNED, SEALED AND DATED THIS _____ day of _____, 20____.

PRINCIPAL

SURETY

By

By

Title

Title

Address of PRINCIPAL

Address of SURETY

Note: Date of Bond must not be prior to date of Contract. If PRINCIPAL is Partnership, all Partners should
execute bond. Surety companies executing bonds must appear on the Treasury Department's most current
list (Circular 570 as amended) and be authorized to transact business in the State of Washington. A power
of attorney must be provided which appoints the SURETY's true and lawful attorney-in-fact to make,
execute, seal and deliver this bond.

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**GENERAL CONDITIONS
FOR LAKE WHATCOM WATER AND SEWER DISTRICT FACILITY CONSTRUCTION**

PART 1 - GENERAL PROVISIONS

1.01 DEFINITIONS

- A. "Addenda" means written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
- B. "Agreement" means the written instrument which is evidence of the agreement between Owner and Contractor covering the Work. The words "Agreement" and "Contract" may be used interchangeably and shall have the same meaning.
- C. "Application for Payment" means a completed written request on a form acceptable to Owner which is submitted by Contractor to A/E for payment of Work completed in accordance with the Contract Documents and approved Schedule of Values, supported by such substantiating data as Owner or A/E may require.
- D. "Architect," "Engineer," or "A/E" means a person or entity lawfully entitled to practice architecture or engineering, representing Owner within the limits of its delegated authority.
- E. "Bid" means the offer or proposal of a Bidder submitted on the prescribed form setting forth the prices of the Work to be performed.
- F. "Bidder" means the person or legal entity who submits a Bid directly to Owner.
- G. "Bidding Documents" means the Bidding Requirements and the proposed Contract Documents (including all Addenda).
- H. "Bidding Requirements" means the Advertisement for Bids, the Instructions to Bidders, Supplemental Bidder Responsibility Criteria, Bid Bond, Bid Proposal Form, along with any supplementary requirements.
- I. "Change Order" means a written instrument which is signed by Owner and Contractor stating their agreement upon all of the following: (1) a change in the Work; (2) the amount of the adjustment in the Contract Sum, if any, and (3) the extent of the adjustment in the Contract Times, if any.
- J. "Claim" means a demand or assertion made in writing by Owner or Contractor seeking adjustment of Contract Sum or Contract Time, or both, or other relief with respect to the terms of the Contract. A Claim is Contractor's exclusive remedy for resolving disputes with Owner regarding the terms of a Change Order or a request for equitable adjustment, as more fully set forth in part 8. A demand for money or services by a third party is not a Claim.
- K. "Contract" means the entire and integrated written agreement between the Owner and Contractor covering the Work and includes without limitation all Contract Documents for the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral. The words "Contract" and "Agreement" may be used interchangeably and shall have the same meaning.
- L. "Contract Award Amount" is the sum of the Base Bid and any accepted Alternates.
- M. "Contract Documents" means the Agreement, Advertisement for Bids, Instructions for Bidders, completed Form of Proposal, General Conditions, Special Conditions such as Drinking Water State Revolving Fund Conditions if applicable, Supplemental Conditions, Public Works Contract, other Special Forms including for Bonds, Drawings and Specifications, Plans, and all Addenda and modifications thereof.
- N. "Contract Sum" is the total amount payable by Owner to Contractor for performance and completion of the Work in accordance with the Contract Documents.

**GENERAL CONDITIONS
FOR LAKE WHATCOM WATER AND SEWER DISTRICT FACILITY CONSTRUCTION**

- O. "Contract Time(s)" is the number of calendar days allotted in the Contract Documents or added by Change Order for (i) achieving Milestones, if any; (ii) achieving Substantial Completion of the Work; and (iii) Final Completion of the Work.
- P. "Contractor" means the person or legal entity who has agreed with Owner to perform the Work in accordance with the Contract Documents. This term includes Contractor's agents, representatives, and employees.
- Q. "Day(s)" unless otherwise specified, day(s) shall mean calendar day(s).
- R. "Drawings" are the graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, and may include plans, elevations, sections, details, schedules, and diagrams. Shop Drawings and other Contractor submittals are not Drawings as so defined.
- S. "Final Acceptance" means the written acceptance issued to Contractor by Owner after Contractor has completed the requirements of the Contract Documents.
- T. "Final Completion" means that the Work is fully and finally completed in accordance with the Contract Documents and all the obligations of the Contractor under the Contract are fulfilled by the Contractor.
- U. "Force Majeure" means those acts entitling Contractor to request an equitable adjustment in the Contract Time, as more fully set forth in paragraph 3.05A.
- V. "Effective Date of the Agreement" means the date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver the Agreement.
- W. "General Conditions" means Standard General Conditions of the Construction Contract (this Section 00700).
- X. "Laws and Regulations" means any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all local, state, and federal governmental bodies, agencies, authorities, and other courts having jurisdiction.
- Y. "Milestone" means a principal event specified in the Contract Documents, if any, which identifies an intermediate completion date or time prior to Substantial Completion of all the Work.
- Z. "Notice" means a written notice which has been delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended or, if delivered or sent by registered or certified mail, to the last business address known to the party giving notice.
- AA. "Notice to Proceed" means a notice from Owner to Contractor that defines the date on which the Contract Time begins to run.
- BB. "Owner" means the Lake Whatcom Water & Sewer District or its authorized representative with the authority to enter into, administer, and/or terminate the Work in accordance with the Contract Documents and make related determinations and findings.
- CC. "Person" means a corporation, partnership, business association of any kind, trust, company, or individual.
- DD. "Prior Occupancy" means Owner's use of all or parts of the Project before Substantial Completion.
- EE. "Progress Schedule" means a schedule of the Work, in a form satisfactory to Owner, as further set forth in section 3.02.
- FF. "Project" means the total construction of which the Work performed in accordance with the Contract Documents may be the whole or a part and which may include construction by Owner or by separate contractors.

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- GG. "Project Float" means surplus time available to reach Substantial Completion or final completion of the Project within the Contract Time based on reasonable estimates for performance of Work shown on the Progress Schedule.
- HH. "Project Manual" means the volume usually assembled for the Work which may include the bidding requirements, sample forms, and other Contract Documents.
- II. "Project Record" means the separate set of Drawings and Specifications as further set forth in paragraph 4.02A.
- JJ. "Schedule of Submittals" means a written schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
- KK. "Schedule of Values" means a written schedule, prepared and maintained by Contractor, allocating the total Contract Sum to each principal category of Work, in such detail as requested by Owner. The Schedule of Values shall be used as a basis to review Contractor's Application for Payment and is further defined in Section 6.02.
- LL. "Shop Drawings" means all drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work, and as further defined in Section 4.03.A.
- MM. "Specifications" are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services.
- NN. "Subcontract" means a contract entered into by Subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind for or in connection with the Work.
- OO. "Subcontractor" means any person or entity, other than Contractor, who agrees to furnish or furnishes any supplies, materials, equipment, or services of any kind in connection with the Work.
- PP. "Substantial Completion" means that stage in the progress of the Work where Owner has full and unrestricted use and benefit of the facilities for the purposes intended, as more fully set forth in section 6.07.
- QQ. "Supplementary Conditions" means that part of the Contract Documents, if any, which amends or supplements these General Conditions.
- RR. "Supplier" means a manufacturer, fabricator, supplier, distributor, material man, or vendor, having a direct contact with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
- SS. "Unit Price Work" means Work to be paid on the basis of unit prices.
- TT. "Work" means the entire, or any portion thereof, construction and services required by the Contract Documents, and includes, but is not limited to, labor, materials, supplies, equipment, services, permits, and the manufacture and fabrication of components, performed, furnished, or provided in accordance with the Contract Documents.

1.02 ORDER OF PRECEDENCE

Any conflict or inconsistency in the Contract Documents shall be resolved by giving the documents precedence in the following order.

1. Signed Contract, including any Change Orders, and any Special Forms.
2. Addenda
3. Supplemental Conditions.
4. General Conditions.

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5. Specifications--provisions in Division 1 shall take precedence over provisions of any other Division.
6. Drawings--in case of conflict within the Drawings, figure dimensions on drawings shall take precedence over scale dimensions, and detailed drawings shall take precedence over general drawings.
7. Signed and Completed Form of Proposal.
8. Instructions to Bidders.
9. Advertisement for Bids.

1.03 EXECUTION AND INTENT

Contractor makes the following representations to Owner:

- A. The Contract Sum is reasonable compensation for the Work and the Contract Time is adequate for the performance of the Work, as represented by the Contract Documents;
- B. Contractor has carefully reviewed the Contract Documents, visited and examined the Project site, become familiar with the local conditions in which the Work is to be performed, and satisfied itself as to the nature, location, character, quality and quantity of the Work, the labor, materials, equipment, goods, supplies, work, services and other items to be furnished and all other requirements of the Contract Documents, as well as the surface and subsurface conditions and other matters that may be encountered at the Project site or affect performance of the Work or the cost or difficulty thereof;
- C. Contractor is financially solvent, able to pay its debts as they mature, and possesses sufficient working capital to complete the Work and perform Contractor's obligations required by the Contract Documents; and
- D. Contractor is able to furnish the plant, tools, materials, supplies, equipment and labor required to complete the Work and perform the obligations required by the Contract Documents and has sufficient experience and competence to do so.

PART 2 - INSURANCE AND BONDS

2.01 CONTRACTOR'S LIABILITY INSURANCE

Prior to commencement of the Work, Contractor shall obtain all the insurance required by the Contract Documents and provide evidence satisfactory to Owner that such insurance has been procured. Review of the Contractor's insurance by Owner shall not relieve or decrease the liability of Contractor. Companies writing the insurance to be obtained by this part shall be licensed to do business under Chapter 48 RCW or comply with the Surplus Lines Law of the State of Washington. Contractor shall include in its bid the cost of all insurance and bond costs required to complete the base bid work and accepted alternates. Insurance carriers providing insurance in accordance with the Contract Documents shall be acceptable to Owner, and its A. M. Best rating shall be indicated on the insurance certificates.

- A. Contractor shall maintain the following insurance coverage during the Work and for one year after Final Acceptance. Contractor shall also maintain the following insurance coverage during the performance of any corrective Work required by section 5.17.
 1. General liability on the CGL 00 01 10 01 form or its equivalent which will include:
 - a. Completed operations/products liability;
 - b. Explosion, collapse, and underground; and
 - c. Employer's liability coverage.

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2. Automobile liability

- B. Contractor shall comply with the Washington State Industrial Insurance Act and, if applicable, the Federal Longshoremen's and Harbor Workers' Act and the Jones Act.
- C. All insurance coverages shall protect against claims for damages for personal and bodily injury or death, as well as claims for property damage, which may arise from operations in connection with the Work whether such operations are by Contractor or any Subcontractor.
- D. All insurance coverages shall be endorsed to include Owner and A/E as additional named insureds for Work performed in accordance with the Contract Documents, and all insurance certificates shall evidence the Owner and A/E as additional insureds.

2.02 COVERAGE LIMITS

- A. Insurance Coverage Certificates. The Contractor shall furnish acceptable proof of insurance coverage on the State of Washington Certificate of Insurance form SF500A, dated 07/02/92 or ACORD form.

B. Required Coverages

1. Commercial General Liability Insurance – The Contractor shall at all times during the term of this contract, at its cost and expense, carry and maintain general public liability insurance, including contractual liability, against claims for bodily injury, personal injury, death or property damage occurring or arising out of services provided under this contract. This insurance shall cover claims caused by any act, omission, or negligence of the Contractor or its officers, agents, representatives, assigns or servants. The limits of liability insurance, which may be increased as deemed necessary by the contracting parties, shall be:

Each Occurrence	\$2,000,000.00
General Aggregate Limits (other than products – commercial operations)	\$2,000,000.00
Products – Commercial Operations Limit	\$2,000,000.00
Personal and Advertising Injury Limit	\$2,000,000.00
Fire Damage Limit (any one fire)	\$50,000.00
Medical Expense Limit (any one person)	\$5,000.00

2. If the contract is for underground utility work, then the Contractor shall provide proof of insurance for that above in the form of Explosion, Collapse and Underground (XCU) coverage.
3. Employers Liability on an occurrence basis in an amount not less than \$1,000,000.00 per occurrence.
4. Automobile Liability: in the event that services delivered pursuant to this contract involve the use of vehicles or the transportation of clients, automobile liability insurance shall be required. If Contractor-owned personal vehicles are used, a Business Automobile Policy covering at a minimum Code 2 “owned autos only” must be secured. If Contractor employee’s vehicles are used, the Contractor must also include under the Business Automobile Policy Code 9, coverage for non-owned autos. The minimum limits for automobile liability is: \$1,000,000.00 per occurrence, using a combined single limit for bodily injury and property damage.
5. For Contracts for Hazardous Substance Removal (Lead Abatement, Asbestos Abatement, PCB Abatement, etc.)
- a. In addition to providing insurance coverage for the project as outlined above, the Contractor shall provide Pollution Liability insurance for the hazardous substance removal as follows:

<u>EACH OCCURRENCE</u>	<u>AGGREGATE</u>
\$500,000.00	\$1,000,000.00

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or \$1,000,000.00 each occurrence/aggregate bodily injury and property damage combined single limit.

- (1) Insurance certificate must state that the insurer is covering hazardous substance removal.
 - (2) Should this insurance be secured on a “claims made” basis, the coverage must be continuously maintained for two years following the project’s “final completion” through official completion of the project.
- b. For Contracts where hazardous substance removal is a subcomponent of contracted work, the general contractor shall provide to the Owner a certificate of insurance for coverage as defined in e.(1) above. Lake Whatcom Water & Sewer District must be listed as an additional insured. This certificate of insurance must be provided to the Owner prior to commencing work.

2.03 INSURANCE COVERAGE CERTIFICATES AND ENDORSEMENTS

- A. Prior to commencement of the Work, Contractor shall furnish to Owner a completed certificate of insurance coverage and endorsement specifically stating that the insurance company or companies issuing the insurance policies contained in the Certificate of Insurance shall give the Owner a minimum of forty-five (45) days’ written notice in the event of cancellation of or material change in any of the applicable policies. The endorsement shall give a brief description of the Work and name the Owner and A/E as co-insureds.
- B. All insurance certificates shall name Owner's Project number and Project title.
- C. All insurance certificates shall specifically require 45 days prior notice to Owner of cancellation or any material change, except 30 days for surplus line insurance.

2.04 PAYMENT AND PERFORMANCE BONDS

- A. Payment and performance bonds for 100% of the Contract Sum, including all Change Orders and state sales tax, shall be furnished for the Work. These bonds shall remain in effect until one (1) year after Final Acceptance. No payment or performance bond is required if the Contract Sum is \$35,000 or less and Contractor agrees that Owner may, in lieu of the bond, retain 50% of the Contract Sum for the period allowed by RCW 39.08.010.
- B. Within fourteen (14) days after the receipt of the Notice of Intent to Award, the Contractor shall furnish the Owner with payment and performance bonds.
- C. Payment Bond and Performance Bond shall be executed on the template forms provided in the Contract Documents.
- D. All bonds, including without limitation Payment Bonds and Performance Bonds, shall be in a form provided in the Contract Documents or in a form acceptable to Owner, and shall be executed by such sureties as are named on the list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of Treasury. All bonds signed by an agent or attorney-in-fact, must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- E. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in the state of Washington or it ceases to meet the requirements of Section 2.04.D, Contractor shall promptly notify Owner and shall within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of this Section 2.04.

2.05 ADDITIONAL BOND SECURITY

Contractor shall promptly furnish additional security (bond rider) to protect Owner and persons supplying labor or materials required by the Contract Documents if:

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- A. Owner has a reasonable objection to the surety; or
- B. Any surety fails to furnish reports on its financial condition if requested by Owner.
- C. The contract amount is increased by 15% or more.

2.06 BUILDER'S RISK INSURANCE

- A. The Owner will provide Builder's Risk Insurance (also referred to as Course of Construction Coverage). The Owner can provide Contractor with proof of Builder's Risk Insurance coverage upon request. The Contractor shall provide a project and site-specific loss control plan (SSLCP) as required under Section 00700 General Conditions 5.07 Protection of Persons and Property, Item A.6, and outlined in the Water & Sewer Risk Management pool (WSRMP): Builder's Risk – Hazard Evaluation Guide (FS-01-10).
- B. Owner and Contractor waive all subrogation rights against each other, any Subcontractors, A/E, A/E's subconsultants, separate contractors described in section 5.20, if any, and any of their subcontractors, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this section or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by Owner as fiduciary. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

PART 3 - TIME AND SCHEDULE

3.01 PROGRESS AND COMPLETION

Contractor shall diligently prosecute the Work, with adequate forces, achieve Substantial Completion within the Contract Time, and achieve Final Completion within a reasonable period thereafter.

3.02 PROGRESS SCHEDULE

- A. Unless otherwise provided in Division 1, Contractor shall, within 14 days after issuance of the Notice to Proceed, submit a preliminary Progress Schedule. The Progress Schedule shall show the sequence in which Contractor proposes to perform the Work, and the dates on which Contractor plans to start and finish major portions of the Work and all critical path activities, including dates for shop drawings and other submittals, and for acquiring materials and equipment.
- B. The Progress Schedule shall be in the form of a Critical Path Method (CPM) logic network or, with the written approval of the Owner, a bar chart schedule may be submitted. The scheduling of construction is the responsibility of the Contractor and is included in the Contract to assure adequate planning and execution of the work. The Progress Schedule and Schedule of Submittals will be used to evaluate progress of the Work for payment based on the Schedule of Values. The Progress Schedule and Schedule of Submittals shall show the Contractor's planned order and interdependence of activities, and sequence of Work. As a minimum the schedule shall include:
 - Date of Notice to Proceed;
 - Activities (description, resources, durations, individual responsible for activity, early starts, late starts, early finishes, late finishes, etc.);
 - Critical Path;
 - Utility Shutdowns;
 - Milestones;
 - Interrelationships and dependence of activities;
 - Planned vs. actual status for each activity;
 - Substantial completion;

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- Punch list;
- Final inspection;
- Final completion;
- Project Float time; and
- Show the physical completion of all Work within the authorized Contract Times

The Progress Schedule duration shall be based on the Contract Times listed on the Bid Proposal form. The Owner shall not be obligated to accept any early completion schedule suggested by the Contractor. The Contract Times shall establish the dates for Substantial Completion and Final Completion of the Project.

If the Contractor reasonably believes that the Work can be completed in less than the Contract Time, then the surplus time shall be considered Project Float. This Project Float time shall be shown on the Progress Schedule. It shall be available to accommodate changes in the work and unforeseen conditions.

Project Float belongs to the Project and shall not be for the exclusive benefit of any party.

- C. Owner shall return comments on the preliminary Progress Schedule to Contractor within 14 days of receipt. Contractor shall revise and resubmit its Progress Schedule, as necessary. Owner may withhold a portion of progress payments until a Progress Schedule has been submitted which meets the requirements of this section. Review by Owner of Contractor's Progress Schedule or Schedule of Submittals does not constitute an approval or acceptance of Contractor's construction means, methods, or sequencing, or its ability to complete the Work within the Contract Times. The Contractor alone shall remain responsible for adjusting forces, equipment availability, and Work schedules to ensure completion of the Work within the Contract Times.
- D. Contractor shall utilize and comply with the Progress Schedule. On a monthly basis, or as otherwise directed by Owner, Contractor shall submit an updated Progress Schedule at its own expense to Owner indicating actual progress. Progress Schedule updates shall reflect the actual duration and sequence of as-constructed Work activities, including changed Work, approved time extensions, any construction delays or other conditions that affect the progress of the Work, any modifications to the as-planned sequence or duration of remaining activities, and the Substantial Completion of all remaining Work in the Contract Time. If, in the opinion of Owner, Contractor is not in conformance with the Progress Schedule for reasons other than acts of Force Majeure as identified in section 3.05, Contractor shall take such steps as are necessary to bring the actual completion dates of its Work into conformance with the Contract Times, or revise the Progress Schedule to reconcile with the actual progress of the Work; provided that, such revision to the Progress Schedule that will change the Contract Times may only be made by Change Order.
- E. Contractor shall promptly notify Owner in writing of any actual or anticipated event which is delaying or could delay achievement of any Milestone or performance of any critical path activity of the Work. Contractor shall indicate the expected duration of the delay, the anticipated effect of the delay on the Progress Schedule, and the action being or to be taken to correct the problem. Provision of such notice does not relieve Contractor of its obligation to complete the Work within the Contract Times.

3.03 OWNER'S RIGHT TO SUSPEND THE WORK FOR CONVENIENCE

- A. Owner may, at its sole discretion and without cause, order Contractor, in writing, to suspend all or any part of the Work for up to 90 days, or for such longer period as mutually agreed.
- B. Upon receipt of a written notice suspending the Work, Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of cost of performance directly attributable to such suspension. Within a period up to 90 days after the notice is delivered to Contractor, or within any extension of that period to which the parties shall have agreed, Owner shall either:
1. Cancel the written notice suspending the Work; or
 2. Terminate the Work covered by the notice as provided in the termination provisions of part 9.

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- C. If a written notice suspending the Work is cancelled or the period of the notice or any extension thereof expires, Contractor shall resume Work.
- D. Contractor shall be entitled to an equitable adjustment in the Contract Time, or Contract Sum, or both, for increases in the time or cost of performance directly attributable to such suspension, provided Contractor complies with all requirements set forth in part 7.

3.04 OWNER'S RIGHT TO STOP THE WORK FOR CAUSE

- A. If Contractor fails or refuses to perform its obligations in accordance with the Contract Documents (including without limitation failure to supply sufficient skilled workers or suitable materials or equipment), Owner may order Contractor, in writing, to stop the Work, or any portion thereof, until satisfactory corrective action has been taken.
- B. Contractor shall not be entitled to an equitable adjustment in the Contract Time or Contract Sum for any increased cost or time of performance attributable to Contractor's failure or refusal to perform or from any reasonable remedial action taken by Owner based upon such failure.

3.05 DELAY

- A. Any delay in or failure of performance by Owner or Contractor, other than the payment of money, shall not constitute a default hereunder if and to the extent the cause for such delay or failure of performance was unforeseeable and beyond the control of the party ("Force Majeure"). Acts of Force Majeure include, but are not limited to:
 - 1. Acts of God or the public enemy;
 - 2. Acts or omissions of any government entity;
 - 3. Fire or other casualty for which Contractor is not responsible;
 - 4. Quarantine or epidemic;
 - 5. Strike or defensive lockout;
 - 6. Unusually severe weather, in excess of weather conditions experienced within the area any time in the preceding ten (10) years:
 - a. Monthly rainfall in excess of the highest monthly rainfall experienced for the same month.
 - b. Monthly snowfall in excess of the highest monthly snowfall experienced for the same month.
 - 7. Unusual delay in receipt of supplies or products which were ordered and expedited and for which no substitute reasonably acceptable to Owner was available.
- B. Contractor shall be entitled to an equitable adjustment in the Contract Time for changes in the time of performance directly attributable to an act of Force Majeure, provided it makes a request for equitable adjustment according to section 7.03. Contractor shall not be entitled to an adjustment in the Contract Sum resulting from an act of Force Majeure.
- C. Contractor shall be entitled to an equitable adjustment in Contract Time, and may be entitled to an equitable adjustment in Contract Sum, if the cost or time of Contractor's performance is changed due to the fault or negligence of Owner, provided the Contractor makes a request according to sections 7.02 and 7.03.
- D. Contractor shall not be entitled to an adjustment in Contract Time or in the Contract Sum for any delay or failure of performance to the extent such delay or failure was caused by Contractor or anyone for whose acts Contractor is responsible.

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- E. To the extent any delay or failure of performance was concurrently caused by the Owner and Contractor, Contractor shall be entitled to an adjustment in the Contract Time for that portion of the delay or failure of performance that was concurrently caused, provided it makes a request for equitable adjustment according to section 7.03, but shall not be entitled to an adjustment in Contract Sum.
- F. Contractor shall make all reasonable efforts to prevent and mitigate the effects of any delay, whether occasioned by an act of Force Majeure or otherwise.

3.06 NOTICE TO OWNER OF LABOR DISPUTES

- A. If Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay timely performance in accordance with the Contract Documents, Contractor shall immediately give notice, including all relevant information, to Owner.
- B. Contractor shall insert a provision in its Subcontracts and to require insertion in all sub-subcontracts, that in the event timely performance of any such contract is delayed or threatened by delay by any actual or potential labor dispute, the Subcontractor or Sub-subcontractor shall immediately notify the next higher tier Subcontractor or Contractor, as the case may be, of all relevant information concerning the dispute.

3.07 DAMAGES FOR FAILURE TO ACHIEVE TIMELY COMPLETION

- A. Liquidated Damages
 - 1. Timely performance and completion of the Work is essential to Owner and time limits stated in the Contract Documents are of the essence. Owner will incur serious and substantial damages if Substantial Completion of the Work does not occur within the Contract Time stated for Substantial Completion. However, it would be difficult if not impossible to determine the exact amount of such damages. Consequently, liquidated damages are calculated as follows:
$$LD = \frac{0.15C}{T}$$

Where: LD = liquidated damages per calendar day (rounded to nearest dollar)
C = original Contract Award Amount
T = original Contract Time in calendar days for achieving Substantial Completion
 - 2. The liquidated damage amounts set forth in the Contract Documents will be assessed not as a penalty, but as liquidated damages for breach of the Contract Documents. This amount is fixed and agreed upon by and between the Contractor and Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain. This amount shall be construed as the actual amount of damages sustained by the Owner, and may be retained by the Owner and deducted from periodic payments to the Contractor.
 - 3. Assessment of liquidated damages shall not release Contractor from any further obligations or liabilities pursuant to the Contract Documents.

- B. Actual Damages

Actual damages will be assessed for failure to achieve Final Completion within the time provided. Actual damages will be calculated on the basis of direct engineering, architectural, administrative, and other related costs attributable to the Project from the date when Final Completion should have been achieved, based on the date Substantial Completion is actually achieved, to the date Final Completion is actually achieved. Owner may offset these costs against any payment due Contractor.

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PART 4 - SPECIFICATIONS, DRAWINGS, AND OTHER DOCUMENTS

4.01 DISCREPANCIES AND CONTRACT DOCUMENT REVIEW

- A. The intent of the Specifications and Drawings is to describe a complete Project to be constructed in accordance with the Contract Documents. Contractor shall furnish all labor, materials, equipment, tools, transportation, permits, and supplies, and perform the Work required in accordance with the Drawings, Specifications, and other provisions of the Contract Documents.
- B. The Contract Documents are complementary. What is required by one part of the Contract Documents shall be binding as if required by all. Anything mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be of like effect as if shown or mentioned in both.
- C. Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by Owner. If, during the performance of the Work, Contractor finds a conflict, error, inconsistency, or omission in the Contract Documents, it shall promptly and before proceeding with the Work affected thereby, report such conflict, error, inconsistency, or omission to A/E in writing.
- D. Contractor shall do no Work without applicable Drawings, Specifications, or written modifications, or Shop Drawings where required, unless instructed to do so in writing by Owner. If Contractor performs any construction activity, and it knows or reasonably should have known that any of the Contract Documents contain a conflict, error, inconsistency, or omission, or conflict with an instruction from any Supplier, or applicable Laws and Regulations, Contractor shall be responsible for the performance and shall bear the cost for its correction.
- E. Contractor shall provide any work or materials the provision of which is clearly implied and is within the scope of the Contract Documents even if the Contract Documents do not mention them specifically.
- F. Questions regarding interpretation of the requirements of the Contract Documents shall be referred to the A/E.

4.02 PROJECT RECORD

- A. Contractor shall legibly mark in ink on a separate set of the Drawings and Specifications all actual construction, including depths of foundations, horizontal and vertical locations of internal and underground utilities and appurtenances (new and existing) referenced to permanent visible and accessible surface improvements, field changes of dimensions and details, actual suppliers, manufacturers and trade names, models of installed equipment, and Change Order proposals. This separate set of Drawings and Specifications shall be the "Project Record."
- B. The Project Record shall be maintained on the project site throughout the construction and shall be clearly labeled "PROJECT RECORD". The Project Record shall be updated at least weekly noting all changes and shall be available to Owner at all times.
- C. Contractor shall submit the completed and finalized Project Record to A/E prior to Final Acceptance.

4.03 SHOP DRAWINGS

- A. "Shop Drawings" means documents and other information required to be submitted to A/E by Contractor pursuant to the Contract Documents, showing in detail: the proposed fabrication and assembly of structural elements; and the installation (i.e. form, fit, and attachment details) of materials and equipment. Shop Drawings include, but are not limited to, drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, samples, and similar materials furnished by Contractor to explain in detail specific portions of the Work required by the Contract Documents. For materials and equipment to be incorporated into the Work, Contractor submittal shall include the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the item. When directed, Contractor shall submit all samples at its own expense. Owner may duplicate, use, and disclose Shop Drawings provided in accordance with the Contract Documents.

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- B. Contractor shall coordinate all Shop Drawings, and review them for accuracy, completeness, and compliance with the Contract Documents and shall indicate its approval thereon as evidence of such coordination and review. Where required by law, Shop Drawings shall be stamped by an appropriate professional licensed by the state of Washington. Shop Drawings submitted to A/E without evidence of Contractor's approval shall be returned for resubmission. Contractor shall review, approve, and submit Shop Drawings with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of Owner or separate contractors. Contractor's Schedule of Submittals shall allow 14 calendar days for A/E review. A/E will review, approve, or take other appropriate action on the Shop Drawings. Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings until the respective submittal has been reviewed and the A/E has approved or taken other appropriate action. Owner and A/E shall respond to Shop Drawing submittals with reasonable promptness. Any Work by Contractor shall be in accordance with reviewed Shop Drawings. Submittals made by Contractor which are not required by the Contract Documents may be returned without action.
- C. Approval, or other appropriate action with regard to Shop Drawings, by Owner or A/E shall not relieve Contractor of responsibility for any errors or omissions in such Shop Drawings, nor from responsibility for compliance with the requirements of the Contract Documents. Unless specified in the Contract Documents, review by Owner or A/E shall not constitute an approval of the safety precautions employed by Contractor during construction, or constitute an approval of Contractor's means or methods of construction. If Contractor fails to obtain approval before installation, and the item or work is subsequently rejected, Contractor shall be responsible for all costs of correction.
- D. If Shop Drawings show variations from the requirements of the Contract Documents, Contractor shall describe such variations in writing, separate from the Shop Drawings, at the time it submits the Shop Drawings containing such variations. If A/E approves any such variation, an appropriate Change Order will be issued. If the variation is minor and does not involve an adjustment in the Contract Sum or Contract Time, a Change Order need not be issued; however, the modification shall be recorded upon the Project Record.
- E. Unless otherwise provided in Division I, Contractor shall submit to A/E for approval three (3) hard copies and electronic PDF (Adobe Acrobat Portable Document File) file(s) of all Shop Drawings. Unless otherwise indicated, 2 sets of all Shop Drawings shall be retained by A/E and one (1) set and PDF file(s) shall be returned to Contractor. Files in electronic media format of text, data, graphics, or other types are furnished only for convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies shall govern.
- F. It is expected that not more than one resubmittal of any Shop Drawing or Sample will be required to satisfactorily revise an original submittal. Costs incurred by Owner, including but not limited to work by A/E, to review resubmittals after the first resubmittal, may be deducted by Owner from amounts payable to Contractor

4.04 ORGANIZATION OF SPECIFICATIONS

Specifications are prepared in sections which conform generally with trade practices. These sections are for Owner and Contractor convenience and shall not control Contractor in dividing the Work among the Subcontractors or in establishing the extent of the Work to be performed by any trade.

4.05 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS, AND OTHER DOCUMENTS

- A. The Drawings, Specifications, and other documents prepared by A/E are instruments of A/E's service through which the Work to be executed by Contractor is described. Neither Contractor nor any Subcontractor shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by A/E, and A/E shall be deemed the author of them and will, along with any rights of Owner, retain all common law, statutory, and other reserved rights, in addition to the copyright. All copies of these documents, except Contractor's set, shall be returned or suitably accounted for to A/E, on request, upon completion of the Work.
- B. The Drawings, Specifications, and other documents prepared by the A/E, and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor on other projects or for additions to this Project outside the scope of the Work without the specific written consent of Owner

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and A/E. Contractor and Subcontractors are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications, and other documents prepared by A/E appropriate to and for use in the execution of their Work.

- C. Contractor and all Subcontractors grant a non-exclusive license to Owner, without additional cost or royalty, to use for its own purposes (including reproduction) all Shop Drawings, together with the information and diagrams contained therein, prepared by Contractor or any Subcontractor. In providing Shop Drawings, Contractor and all Subcontractors warrant that they have authority to grant to Owner a license to use the Shop Drawings, and that such license is not in violation of any copyright or other intellectual property right. Contractor agrees to defend and indemnify Owner pursuant to the indemnity provisions in section 5.22 from any violations of copyright or other intellectual property rights arising out of Owner's use of the Shop Drawings hereunder, or to secure for Owner, at Contractor's own cost, licenses in conformity with this section.
- D. The Shop Drawings and other submittals prepared by Contractor, Subcontractors of any tier, or its or their equipment or material suppliers, and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor of any tier, or material or equipment supplier, on other projects or for additions to this Project outside the scope of the Work without the specific written consent of Owner. The Contractor, Subcontractors of any tier, and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Shop Drawings and other submittals appropriate to and for use in the execution of their Work under the Contract Documents.

PART 5 - PERFORMANCE

5.01 CONTRACTOR CONTROL AND SUPERVISION

- A. Contractor shall supervise and direct the Work, using its best skill and attention, and shall perform the Work in a skillful manner. Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work, unless the Contract Documents give other specific instructions concerning these matters. Contractor shall disclose its means and methods of construction when requested by Owner.
- B. Performance of the Work shall be directly supervised by a competent superintendent who is satisfactory to Owner and has authority to act for Contractor. The superintendent shall not be changed without the prior written consent of Owner.
- C. Contractor shall be responsible to Owner for acts and omissions of Contractor, Subcontractors, and their employees and agents.
- D. Contractor shall enforce strict discipline and good order among Contractor's employees and other persons performing the Work. Contractor shall not permit employment of persons not skilled in tasks assigned to them. Contractor's employees shall at all times conduct business in a manner which assures fair, equal, and nondiscriminatory treatment of all persons. Owner may, by written notice, request Contractor to remove from the Work or Project site any employee Owner reasonably deems incompetent, careless, or otherwise objectionable.
- E. Contractor shall keep on the Project site a copy of the Drawings, Specifications, addenda, reviewed Shop Drawings, and permits and permit drawings.

5.02 PERMITS, FEES, AND NOTICES

- A. Unless otherwise provided in the Contract Documents, Contractor shall pay for and obtain all permits, licenses, and inspections necessary for proper execution and completion of the Work. Prior to Final Acceptance the approved, signed permits shall be delivered to Owner.
- B. The actual cost of the general building permit (only) and the public utility hook-up fees will be a direct reimbursement to the Contractor or paid directly to the permitting agency by the Owner. Fees for these permits should not be included by the Contractor in their bid amount.

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- C. Contractor shall comply with and give notices required by all federal, state, and local laws, ordinances, rules, regulations, and lawful orders of public authorities applicable to performance of the Work.
- D. The Contractor shall submit copies of each required permit on the Project to the Owner's representative or A/E. Nothing in this part shall be construed as imposing a duty upon the Owner or A/E to secure permits.

5.03 PATENTS AND ROYALTIES

Contractor is responsible for, and shall pay, all royalties and license fees. Contractor shall defend, indemnify, and hold Owner harmless from any costs, expenses, and liabilities arising out of the infringement by Contractor of any patent, copyright, or other intellectual property right used in the Work; however, provided that Contractor gives prompt notice, Contractor shall not be responsible for such defense or indemnity when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents. If Contractor has reason to believe that use of the required design, process, or product constitutes an infringement of a patent or copyright, it shall promptly notify Owner of such potential infringement.

5.04 PREVAILING WAGES

- A. Statement of Intent to Pay Prevailing Wages: Before payment is made by the Owner to the Contractor for any work performed by the Contractor and Subcontractors whose work is included in the application for payment, the Contractor shall submit, or shall have previously submitted to the Owner for the Project, a Statement of Intent to Pay Prevailing Wages, approved by the Department of Labor and Industries, certifying the rate of hourly wage paid and to be paid each classification of laborers, workers, or mechanics employed upon the Work by Contractor and every Subcontractor, of any tier. Such rates of hourly wage shall not be less than the prevailing wage rate.
- B. Affidavit of Wages Paid: Prior to release of retainage, the Contractor shall submit to the Owner an Affidavit of Wages Paid, approved by the Department of Labor and Industries, for the Contractor and every Subcontractor, of any tier, that performed work on the Project.
- C. Disputes: Disputes regarding prevailing wage rates shall be referred for arbitration to the Director of the Department of Labor and Industries. The arbitration decision shall be final and conclusive and binding on all parties involved in the dispute as provided for by RCW 39.12.060.
- D. Statement with pay application; Post Statements of Intent at job site: Each Application for Payment submitted by Contractor shall state that prevailing wages have been paid in accordance with the pre-filed statement(s) of intent, as approved. Copies of the approved intent statement(s) shall be posted on the job site with the address and telephone number of the Industrial Statistician of the Department of Labor and Industries where a complaint or inquiry concerning prevailing wages may be made.
- E. Contractor to pay for Statements of Intent and Affidavits: In compliance with chapter 296-127 WAC, Contractor shall pay to the Department of Labor and Industries the currently established fee(s) for each statement of intent and/or affidavit of wages paid submitted to the Department of Labor and Industries for certification.
- F. The Contractor shall pay the higher of Federal Davis-Bacon Act Wages and State of Washington Prevailing Wages.

5.05 HOURS OF LABOR AND MAXIMUM ENVIRONMENTAL NOISE LEVELS

- A. Contractor shall comply with all applicable provisions of RCW 49.28 and they are incorporated herein by reference. Pursuant to that statute, no laborer, worker, or mechanic employed by Contractor, any Subcontractor, or any other person performing or contracting to do the whole or any part of the Work, shall be permitted or required to work more than eight hours in any one calendar day, provided, that in cases of extraordinary emergency, such as danger to life or property, the hours of work may be extended, but in such cases the rate of pay for time employed in excess of eight hours of each calendar day shall be not less than one and one-half times the rate allowed for this same amount of time during eight hours' service.

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- B. Notwithstanding the preceding paragraph, RCW 49.28 permits a contractor or subcontractor in any public works contract subject to those provisions, to enter into an agreement with its employees in which the employees work up to ten hours in a calendar day. No such agreement may provide that the employees work ten-hour days for more than four calendar days a week. Any such agreement is subject to approval by the employees. The overtime provisions of RCW 49.28 shall not apply to the hours, up to forty hours per week, worked pursuant to any such agreement.
- C. Whatcom County Noise Standards. For project sites outside the City of Bellingham and Sudden Valley, but within Whatcom County, the Contractor shall comply with noise standards established in WAC 173-60, or most current revision.
- D. For project sites within Sudden Valley, the Contractor shall comply with the more stringent of Whatcom County Noise Standards and Sudden Valley Community Association covenants, codes, and restrictions for construction noise. Work that produces noise shall be limited to the hours between 8 AM and 6 PM Monday through Saturday. Work crews may begin preparation no earlier than 7:30 AM weekdays and 8 AM Saturdays. Sunday, holiday and evening work shall be limited to quiet work.
- E. For project sites within the City of Bellingham City Limits, the Contractor shall comply with City of Bellingham Municipal Code 10.24.120 – Public Disturbance Noise, which prohibits construction noise from the hours between 10 PM and 7 AM. .

5.06 NONDISCRIMINATION

- A. Discrimination in all phases of employment is prohibited by, among other laws and regulations, Title VII of the Civil Rights Act of 1964, the Vietnam Era Veterans Readjustment Act of 1974, sections 503 and 504 of the Vocational Rehabilitation Act of 1973, the Equal Employment Act of 1972, the Age Discrimination Act of 1967, the Americans with Disabilities Act of 1990, the Civil Rights Act of 1991, Presidential Executive Order 11246, Executive Order 11375, the Washington State Law Against Discrimination, RCW 49.60, and Gubernatorial Executive Order 85-09. These laws and regulations establish minimum requirements for affirmative action and fair employment practices which Contractor must meet.
- B. During performance of the Work:
 - 1. Contractor shall not discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex, age, marital status, or the presence of any physical, sensory, or mental disability, Vietnam era veteran status, or disabled veteran status, nor commit any other unfair practices as defined in RCW 49.60.
 - 2. Contractor shall, in all solicitations or advertisements for employees placed by or for it, state that all qualified applicants will be considered for employment, without regard to race, creed, color, national origin, sex, age, marital status, or the presence of any physical, sensory, or mental disability.
 - 3. Contractor shall send to each labor union, employment agency, or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice advising the labor union, employment agency, or workers' representative of Contractor's obligations according to the Contract Documents and RCW 49.60.
 - 4. Contractor shall permit access to its books, records, and accounts, and to its premises by Owner, and by the Washington State Human Rights Commission, for the purpose of investigation to ascertain compliance with this section of the Contract Documents.
 - 5. Contractor shall include the provisions of this section in every Subcontract.

5.07 PROTECTION OF PERSONS AND PROPERTY

- A. In carrying out its responsibilities according to the Contract Documents, Contractor shall protect the lives and health of employees performing the Work and other persons who may be affected by the Work; prevent damage to materials,

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supplies, and equipment whether on site or stored off-site; and prevent damage to other property at the site or adjacent thereto. Contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss; shall erect and maintain all necessary safeguards for such safety and protection; and shall notify owners of adjacent property and utilities when prosecution of the Work may affect them. For these purposes, the Contractor shall:

1. Follow Washington Industrial Safety and Health Act (WISHA) regional directives and provide a site-specific safety program that will require an accident prevention and hazard analysis plan for the contractor and each subcontractor on the work site. The Contractor shall develop and submit a site-specific safety plan (SSSP) to the Owner's representative for review prior to the initial scheduled pre-construction meeting. Owner shall have up to 5 working days to review and comment on the SSSP.
 2. Provide adequate safety devices and measures including, but not limited to, the appropriate safety literature, notice, training, permits, placement and use of barricades, signs, signal lights, ladders, scaffolding, staging, runways, hoist, ventilation, air monitoring, construction elevators, shoring, temporary lighting, grounded outlets, wiring, personal protective equipment, vehicles, construction processes, and equipment required by Chapter 19.27 RCW, State Building Code (Uniform Building, Electrical, Mechanical, Fire, and Plumbing Codes); Chapter 212-12 WAC, Fire Marshal Standards, Chapter 49.17 RCW, WISHA; Chapter 296-155 WAC, Safety Standards for Construction Work; Chapter 296-65 WAC; WISHA Asbestos Standard; WAC 296-842, Respirator Standard; WAC 296-62, General Occupation Health Standards, WAC 296-24, General Safety and Health Standards, Chapter 49.70 RCW, Worker and Community Right to Know Act.
 3. Comply with the State Environmental Policy Act (SEPA), Clean Air Act, Shoreline Management Act, and other applicable federal, state, and local statutes and regulations dealing with the prevention of environmental pollution and the preservation of public natural resources.
 4. Post all permits, notices, and/or approvals in a conspicuous location at the construction site.
 5. Provide any additional measures that the Contractor or Owner determines to be reasonable and necessary for ensuring a safe environment in areas open to the public. Nothing in this part shall be construed as imposing a duty upon the Owner or A/E to prescribe safety conditions relating to employees, public, or agents of the Contractors.
 6. Contractor shall designate a qualified and experienced safety representative at the Project site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.
 7. Develop and submit a project and site-specific loss control plan (SSLCP) to the Owner for review prior to the initial scheduled construction meeting. The Owner shall have up to 5 working days to review and comment on the SSLCP.
 8. Contractor shall post applicable federal wage decision and Davis-Bacon Act poster on all job sites.
- B. Contractor shall maintain an accurate record of exposure data on all incidents relating to the Work resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment. Contractor shall immediately report any such incident to Owner. Owner shall, at all times, have a right of access to all records of exposure.
- C. Contractor shall provide all persons working on the Project site with information and training on hazardous chemicals in their work at the time of their initial assignment, and whenever a new hazard is introduced into their work area. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employees at the Project site in accordance with all Laws and Regulations.
1. Information. At a minimum, Contractor shall inform persons working on the Project site of:

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- a. The requirements of chapter 296-62 WAC, General Occupational Health Standards;
 - b. Any operations in their work area where hazardous chemicals are present; and
 - c. The location and availability of written hazard communication programs, including the required list(s) of hazardous chemicals and material safety data sheets required by chapter 296-62 WAC.
2. Training. At a minimum, Contractor shall provide training for persons working on the Project site which includes:
- a. Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
 - b. The physical and health hazards of the chemicals in the work area;
 - c. The measures such persons can take to protect themselves from these hazards, including specific procedures Contractor, or its Subcontractors, or others have implemented to protect those on the Project site from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and
 - d. The details of the hazard communications program developed by Contractor, or its Subcontractors, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.
- D. Contractor's responsibility for hazardous, toxic, or harmful substances shall include the following duties:
- 1. Contractor shall not keep, use, dispose, transport, generate, or sell on or about the Project site, any substances now or hereafter designated as, or which are subject to regulation as, hazardous, toxic, dangerous, or harmful by any federal, state or local law, regulation, statute or ordinance (hereinafter collectively referred to as "hazardous substances", in violation of any such law, regulation, statute, or ordinance, but in no case shall any such hazardous substance be stored more than 90 days on the Project site.
 - 2. Contractor shall promptly notify Owner of all spills or releases of any hazardous substances which are otherwise required to be reported to any regulatory agency and pay the cost of cleanup. Contractor shall promptly notify Owner of all failures to comply with any federal, state, or local law, regulation, or ordinance; all inspections of the Project site by any regulatory entity concerning the same; all regulatory orders or fines; and all responses or interim cleanup actions taken by or proposed to be taken by any government entity or private party on the Project site.
- E. All Work shall be performed with due regard for the safety of the public. Contractor shall perform the Work so as to cause a minimum of interruption of vehicular traffic or inconvenience to pedestrians. All arrangements to care for such traffic shall be Contractor's responsibilities. All expenses involved in the maintenance of traffic by way of detours shall be borne by Contractor.
- F. The Contractor shall maintain any temporary fencing to prevent pedestrians from entering the worksite and to preserve pets, livestock, crops or property when working through or adjacent to private property. The Contractor is liable for all damages resulting from not complying with this requirement.
- G. In an emergency affecting the safety of life or the Work or of adjoining property, Contractor is permitted to act, at its discretion, to prevent such threatened loss or injury, and Contractor shall so act if so authorized or instructed.
- H. Nothing provided in this section shall be construed as imposing any duty upon Owner or A/E with regard to, or as constituting any express or implied assumption of control or responsibility over, Project site safety, or over any other safety conditions relating to employees or agents of Contractor or any of its Subcontractors, or the public.

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5.08 OPERATIONS, MATERIAL HANDLING, AND STORAGE AREAS

- A. Contractor shall confine all operations, including storage of materials, to Owner-approved areas.
- B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be provided by Contractor only with the consent of Owner and without expense to Owner. The temporary buildings and utilities shall remain the property of Contractor and shall be removed by Contractor at its expense upon completion of the Work.
- C. Contractor shall use only established roadways or temporary roadways authorized by Owner. When materials are transported in prosecuting the Work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by federal, state, or local law or regulation.
- D. Ownership and control of all materials or facility components to be demolished or removed from the Project site by Contractor shall immediately vest in Contractor upon severance of the component from the facility or severance of the material from the Project site. Contractor shall be responsible for compliance with all Laws and Regulations governing the storage and ultimate disposal. Contractor shall provide Owner with a copy of all manifests and receipts evidencing proper disposal when required by Owner or applicable law.
- E. Contractor shall be responsible for the proper care and protection of its materials and equipment delivered to the Project site. Materials and equipment may be stored on the premises subject to approval of Owner. When Contractor uses any portion of the Project site as a shop, Contractor shall be responsible for any repairs, patching, or cleaning arising from such use.
- F. Contractor shall protect and be responsible for any damage or loss to the Work, or to the materials or equipment until the date of Substantial Completion, and shall repair or replace without cost to Owner any damage or loss that may occur, except damages or loss caused by the acts or omissions of Owner. Contractor shall also protect and be responsible for any damage or loss to the Work, or to the materials or equipment, after the date of Substantial Completion, and shall repair or replace without cost to Owner any such damage or loss that might occur, to the extent such damages or loss are caused by the acts or omissions of Contractor, or any Subcontractor.

5.09 PRIOR NOTICE OF EXCAVATION

"Excavation" means an operation in which earth, rock, or other material on or below the ground is moved or otherwise displaced by any means, except the tilling of soil less than 12 inches in depth for agricultural purposes, or road ditch maintenance that does not change the original road grade or ditch flow line. Before commencing any excavation, Contractor shall provide notice of the scheduled commencement of excavation to all owners of underground facilities or utilities, through locator services.

5.10 UNFORESEEN PHYSICAL CONDITIONS

- A. If Contractor encounters conditions at the site which are subsurface or otherwise concealed physical conditions which (i) is of such a nature as to establish that any technical data on which Contractor is entitled to rely under Section 5.10.C is materially inaccurate; (ii) differ materially from those indicated in the Contract Documents; or (iii) are unknown physical conditions of an unusual nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then Contractor shall give written notice to Owner promptly and in no event later than 7 days after the first observance of the conditions. Conditions shall not be disturbed prior to such notice and until receipt of a written order to do so from Owner.
- B. If such conditions differ materially and if Contractor believes that the subsurface or physical condition that is uncovered or revealed cause a change in Contractor's cost of, or time required for, performance of any part of the Work, the Contractor may be entitled to an equitable adjustment in the Contract Time or Contract Sum, or both, provided it makes a request therefor as provided in part 7. Owner shall have 4 days to investigate this subject and during this period the Contractor shall undertake other Work at no additional cost to Owner. Owner will review the pertinent condition, determine the necessity of Owner to obtain additional exploration or tests with respect thereto and advise Contractor in writing of findings and conclusions

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- C. Contractor may rely upon the accuracy of the technical data contained in any reports and drawings as are identified at subsection 5.10.C.4, if any, but such reports and drawings are not Contract documents. Except for such reliance on such technical data, Contractor may not rely upon or make any claim against Owner or A/E, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. The completeness of such reports and drawings for Contractor's purposes, including without limitation to any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and any safety precautions and programs incident thereto; or
 2. Other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. Any Contractor interpretation of or conclusion drawn from any technical data or any such other data, interpretations, opinions, or information.
 4. Reports of explorations and tests of subsurface conditions at or contiguous to the Project site known to the Owner at the present time are included in the plans and specifications.
- D. The Contract Sum or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work.
- E. Notwithstanding the foregoing, Contractor shall not be entitled to any adjustment in the Contract Sum or Contract Time(s) if:
1. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Time(s) by submission of a Bid or becoming bound under the Contract; or
 2. The existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Project site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such a final commitment; or
 3. Contractor failed to give the written notice required by Section 5.10.A.
- F. In the event a claim is made for adjustment of Contract Sum or Contract Time(s) pursuant to Section 5.10.E, neither the Owner, nor the A/E, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, damages, or attorney's or other professional fees sustained or paid by Contractor on or in connection with any other project or anticipated project.

5.11 PROTECTION OF EXISTING STRUCTURES, EQUIPMENT, VEGETATION, UTILITIES, AND IMPROVEMENTS

- A. Contractor shall protect from damage all existing structures, equipment, improvements, utilities, and vegetation: at or near the Project site; and on adjacent property of a third party, the locations of which are made known to or should be known by Contractor. Contractor shall repair at its own expense any damage, including that to the property of a third party, resulting from failure to comply with the requirements of the Contract Documents or failure to exercise reasonable care in performing the Work. If Contractor fails or refuses to repair the damage promptly, Owner may have the necessary work performed and charge the cost to Contractor.
- B. Contractor shall only remove trees when specifically authorized to do so, and shall protect vegetation that will remain in place.
- C. The usefulness of existing mail or paper boxes shall not be impaired.

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5.12 LAYOUT OF WORK

- A. Contractor shall plan and lay out the Work in advance of operations so as to coordinate all work without delay or revision.
- B. Contractor shall lay out the Work from Owner-established baselines and bench marks indicated on the Drawings, and shall be responsible for all field measurements in connection with the layout. Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the Work. Contractor shall be responsible for executing the Work to the lines and grades that may be established. Contractor shall be responsible for maintaining or restoring all stakes and other marks established.

5.13 MATERIAL AND EQUIPMENT

- A. All equipment, material, and articles incorporated into the Work shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in the Contract Documents. References in the Specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard quality and shall not be construed as limiting competition. Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of A/E, is equal to that named in the specifications, unless otherwise specifically provided in the Contract Documents.
 - 1. Item equality will be determined by the A/E evaluating whether:
 - a. the proposed item is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - b. the proposed item will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - c. operation and maintenance costs and requirements are reasonably similar; and
 - d. the proposed item has a proven record of performance and comparable availability of service and parts.
 - 2. Contractor shall also certify that, if approved and incorporated into the Work:
 - a. no increase in cost to the Owner or increase in Contract Times will result, and
 - b. the proposed item will conform to the detailed requirements of the item named in the Contract Documents
 - 3. If requested by the A/E, Contractor shall furnish additional information for the A/E's review and consideration. Insufficient or inadequate information to substantiate and or equal determination by the A/E will be grounds for rejection.
- B. Substitute Items. If in A/E's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, it will be considered a proposed substitute item. Contractor shall submit sufficient information as provided below to allow A/E to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefore. Requests for review of proposed substitute items of material or equipment will not be accepted by A/E from anyone other than Contractor. The requirements for review by A/E will be as set forth herein and as A/E may decide is appropriate under the circumstances. Contractor shall make written application to A/E for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1. shall certify that the proposed substitute item:

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- a. will reliably perform at least equally well the functions and achieve the results called for by the general design,
 - b. is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics to that item specified, and
 - c. be suited to the same use as that specified; and
 - d. has a proven record of performance and availability of responsive service.
2. will state:
 - a. the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time or increase the cost to Owner;
 - b. whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - c. whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
3. will identify:
 - a. all variations of the proposed substitute item from that specified;
 - b. available engineering, sales, maintenance, repair, and replacement services; and
 - c. schedule impacts and changes to the construction schedule
4. and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
5. Contractor shall supply three (3) copies of data substantiating compliance of proposed product or supplier with Contract Documents on all requests for approval of change of any product or manufacturer. Each copy shall include:
 - a. detailed description of the proposed change, including:
 - (1) product identification, including manufacturer's name and address;
 - (2) manufacturer's identification, including manufacturer's name and address;
 - (3) samples of proposed products;
 - (4) name, address, and telephone number of contact persons for similar projects on which product was used and date of installation; and
 - (5) drawings indicating and vertical details of all architectural, structural, mechanical and electrical elements of proposed change.
 - b. itemized comparison of proposed substitution with product or supplier specified;
 - c. relation to separate subcontracts and trades;
 - d. cost data on proposed substitution in comparison with product or supplier specified; and

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- e. operation and maintenance requirements and costs;
- 6. Requests for change of product or design shall include certification by the Contractor that:
 - a. The Contractor has personally investigated the proposed product or design deviation and has determined that it is equal or superior in all respects to that specified;
 - b. The Contractor will provide the same guarantee for product or design deviation as for product or design specified; and
 - c. The Contractor will coordinate installation of accepted product or design deviation into work, making such changes as may be required for work to be complete in all respects.
- 7. Requests for change of products will not be considered if:
 - a. They are indicated or implied on project data submittals without a formal request having been submitted; and/or
 - b. Acceptance will require substantial revision to the Contract Documents.
- 8. A/E's Evaluation. A/E will be allowed 14 calendar days within which to evaluate each proposal or submittal made. A/E may require Contractor to furnish additional data about the proposed substitute item. A/E will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until A/E's review is complete, which will be evidenced by either a Change Order or an approved Shop Drawing. A/E will advise Contractor in writing of any negative determination. The A/E may elect to reject any or all requests for deviation without cause or justification. The Contractor shall immediately proceed with the Work in accordance with the Contract Documents upon notification of rejection of any request for deviation.
- 9. Special Guarantee. Owner may require Contractor to furnish, at Contractor's expense, a special performance guarantee or other surety with respect to any substitute, change in construction methods or procedures, or change in design.
- 10. A/E's Cost Reimbursement. A/E will record A/E's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not A/E approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of A/E for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of A/E for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- 11. Contractor's Expense. Contractor shall provide all data in support of any proposed substitute or "or equal" at Contractor's expense. The Contractor shall be responsible for and assume all costs of all elements involving implementing and completing approved deviations including, but not limited to, coordination, confirming dimensions at the job site, design, preparation of plans, procurement of materials and equipment, fabrication, construction, installation and instigation of service. If, in the opinion of the A/E, the completed improvements of each deviation do not fulfill, provide and meet the defined and implied intent of the Contract Documents, the Contractor shall provide the labor, materials, and equipment required to modify the Work to the satisfaction of the A/E. The Contractor shall be responsible for modifications to electrical, structural, mechanical, or other aspects of the work or design as required to install or incorporate materials or equipment selected by the Contractor. Regardless of the method of specification or selection, any product which is installed or incorporated into the work without prior approval of the A/E may not be accepted by the Owner. When material or equipment is specified by performance requirement or reference to specifications, standards, or publications of organizations, the Contractor shall select material or equipment which the Contractor considers to comply with the specified reference standard. The Contractor shall submit a request for approval of the selected product in accordance with this section.

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- C. Contractor shall do all cutting, fitting, or patching that may be required to make its several parts fit together properly, or receive or be received by work of others set forth in, or reasonably implied by, the Contract Documents. Contractor shall not endanger any work by cutting, excavating, or otherwise altering the Work and shall not cut or alter the work of any other contractor unless approved in advance by Owner.
- D. Should any of the Work be found defective, or in any way not in accordance with the Contract Documents, this work, in whatever stage of completion, may be rejected by Owner.

5.14 AVAILABILITY AND USE OF UTILITY SERVICES

- A. Owner shall make all reasonable utilities available to Contractor from existing outlets and supplies, as specified in the Contract Documents. Unless otherwise provided in the Contract Documents, the utility service consumed shall be charged to or paid for by Contractor at prevailing rates charged to Owner or, where the utility is produced by Owner, at reasonable rates determined by Owner. Contractor will carefully conserve any utilities furnished.
- B. Contractor shall, at its expense and in a skillful manner satisfactory to Owner, install and maintain all necessary temporary connections and distribution lines, together with appropriate protective devices, and all meters required to measure the amount of each utility used for the purpose of determining charges. Prior to the date of Final Acceptance, Contractor shall remove all temporary connections, distribution lines, meters, and associated equipment and materials.

5.15 TESTS AND INSPECTION

- A. Contractor shall maintain an adequate testing and inspection program and perform such tests and inspections as are necessary or required to ensure that the Work conforms to the requirements of the Contract Documents. Contractor shall be responsible for inspection and quality surveillance of all its Work and all Work performed by any Subcontractor. Unless otherwise provided, Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. Contractor shall give Owner timely notice of when and where tests and inspections are to be made. Contractor shall maintain complete inspection records and make them available to Owner.
- B. Owner may, at any reasonable time, conduct such inspections and tests as it deems necessary to ensure that the Work is in accordance with the Contract Documents. Owner shall promptly notify Contractor if an inspection or test reveals that the Work is not in accordance with the Contract Documents. Unless the subject items are expressly accepted by Owner, such Owner inspection and tests are for the sole benefit of Owner and do not:
 - 1. Constitute or imply acceptance;
 - 2. Relieve Contractor of responsibility for providing adequate quality control measures;
 - 3. Relieve Contractor of responsibility for risk of loss or damage to the Work, materials, or equipment;
 - 4. Relieve Contractor of its responsibility to comply with the requirements of the Contract Documents; or
 - 5. Impair Owner's right to reject defective or nonconforming items, or to avail itself of any other remedy to which it may be entitled.
- C. Neither observations by an inspector retained by Owner, the presence or absence of such inspector on the site, nor inspections, tests, or approvals by others, shall relieve Contractor from any requirement of the Contract Documents, nor is any such inspector authorized to change any term or condition of the Contract Documents.
- D. Contractor shall promptly furnish, without additional charge, all facilities, labor, material and equipment reasonably needed for performing such safe and convenient inspections and tests as may be required by Owner. Owner may charge Contractor any additional cost of inspection or testing when Work is not ready at the time specified by Contractor for inspection or testing, or when prior rejection makes re-inspection or retest necessary. Owner shall perform its inspections and tests in a manner that will cause no undue delay in the Work.

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5.16 CORRECTION OF NONCONFORMING WORK

- A. If a portion of the Work that is to be inspected, tested, or approved is covered without express concurrence of the A/E, Contractor shall, if ordered by Owner in Owner's sole discretion, be uncovered for Owner's observation and be replaced, all at the Contractor's expense and without change in the Contract Time.
- B. If, at any time prior to Final Completion, Owner desires to examine the Work, or any portion of it, which has been covered, Owner may request to see such Work and it shall be uncovered by Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an adjustment in the Contract Sum for the costs of uncovering and replacement, and, if completion of the Work is thereby delayed, an adjustment in the Contract Time, provided it makes a request therefor as provided in part 7. If such Work is not in accordance with the Contract Documents, the Contractor shall pay the costs of examination and reconstruction and shall not be entitled to any adjustment in Contract Time.
- C. Contractor shall promptly correct Work found by Owner not to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed, or completed. Contractor shall bear all costs of correcting such nonconforming Work, including additional testing and inspections.
- D. If, within one year after the date of Substantial Completion of the Work or designated portion thereof, or within one year after the date for commencement of any system warranties established under section 6.08, or within the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, Contractor shall correct it promptly after receipt of written notice from Owner to do so. Owner shall give such notice promptly after discovery of the condition. This period of one year shall be extended, with respect to portions of Work first performed after Substantial Completion, by the period of time between Substantial Completion and the actual performance of the Work. Contractor's duty to correct with respect to Work repaired or replaced shall run for one year from the date of repair or replacement. Obligations under this paragraph shall survive Final Acceptance.
- E. Contractor shall remove from the Project site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by Contractor nor accepted by Owner.
- F. If Contractor fails to correct nonconforming Work within a reasonable time after written notice to do so, Owner may replace, correct, or remove the nonconforming Work and charge the cost thereof to the Contractor.
- G. Contractor shall bear the cost of correcting destroyed or damaged Work, whether completed or partially completed, caused by Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.
- H. Nothing contained in this section shall be construed to establish a period of limitation with respect to other obligations which Contractor might have according to the Contract Documents. Establishment of the time period of one year as described in paragraph 5.16D relates only to the specific obligation of Contractor to correct the Work, and has no relationship to the time within which the Contractor's obligation to comply with the Contract Documents may be sought to be enforced, including the time within which such proceedings may be commenced.
- I. If Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, Owner may do so instead of requiring its removal and correction, in which case the Contract Sum may be reduced as appropriate and equitable. Owner's acceptance of Work not in accordance with the requirements of the Contract Documents in one or more instances shall not waive the Owner's right to insist on conformance with the Contract Documents in all other instances.

5.17 CLEAN UP

Contractor shall at all times keep the Project site, including hauling routes, infrastructures, utilities, and storage areas, free from accumulations of waste materials. Before completing the Work, Contractor shall remove from the premises its rubbish,

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tools, scaffolding, equipment, temporary structures and materials. Upon completing the Work, Contractor shall leave the Project site in a clean, neat, and orderly condition satisfactory to Owner. If Contractor fails to clean up as provided herein, and after reasonable notice from Owner, Owner may do so and the cost thereof shall be charged to Contractor.

5.18 ACCESS TO WORK

Contractor shall provide Owner and A/E access to the Work in progress wherever located.

5.19 OTHER CONTRACTS

Owner may undertake or award other contracts for additional work at or near the Project site. Contractor shall reasonably cooperate with the other contractors and with Owner's employees and shall carefully adapt scheduling and perform the Work in accordance with these Contract Documents to reasonably accommodate the other work.

5.20 SUBCONTRACTORS AND SUPPLIERS

- A. Before submitting the first Application for Payment, Contractor shall furnish in writing to Owner the names, addresses, and telephone numbers of all Subcontractors, as well as suppliers providing materials in excess of \$10,000. Contractor shall utilize Subcontractors and Suppliers which are experienced and qualified, and meet the requirements of the Contract Documents, if any. Contractor shall not utilize any Subcontractor or Supplier to whom the Owner has a reasonable objection, and shall obtain Owner's written consent before making any substitutions or additions of Subcontractors or Suppliers.
- B. All Subcontracts must be in writing. By appropriate written agreement, Contractor shall require each Subcontractor, so far as applicable to the Work to be performed by the Subcontractor, to be bound to Contractor by terms of the Contract Documents, and to assume toward Contractor all the obligations and responsibilities which Contractor assumes toward Owner in accordance with the Contract Documents. Each Subcontract shall preserve and protect the rights of Owner in accordance with the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. However, nothing in this paragraph shall be construed to alter the contractual relations between Contractor and its Subcontractors with respect to insurance or bonds.
- C. Contractor shall schedule, supervise, and coordinate the operations of all Subcontractors. No Subcontracting of any of the Work shall relieve Contractor from its responsibility for the performance of the Work in accordance with the Contract Documents or any other obligations of the Contract Documents.
- D. Each subcontract agreement for a portion of the Work is hereby assigned by Contractor to Owner provided that:
 - 1. The assignment is effective only after termination by Owner for cause pursuant to Section 9.01 and only for those Subcontracts which Owner accepts by notifying the Subcontractor in writing; and
 - 2. After the assignment is effective, Owner will assume all future duties and obligations toward the Subcontractor which Contractor assumed in the Subcontract.
 - 3. The assignment is subject to the prior rights of the surety, if any, obligated under any bond provided in accordance with the Contract Documents.

5.21 WARRANTY OF CONSTRUCTION

- A. In addition to any special warranties provided elsewhere in the Contract Documents, Contractor warrants that all Work conforms to the requirements of the Contract Documents and is free of any defect in equipment, material, or design furnished, or workmanship performed, by Contractor for a period of one year after the date of Final Acceptance established by formal action of the Board of Commissioners.

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- B. If any work, including materials and equipment is, found to be defective or not in compliance with the Contract Documents, the Contractor shall promptly, without cost to Owner, either correct such work, or, if it has been rejected by Owner, remove and replace it with acceptable work. If the Contractor does not promptly comply with the notification issued by the Owner for correction of defective and/or non-complying work, the Owner may have the Work corrected or removed and replaced and all direct and indirect costs of such removal and replacement, including costs of all professional services, shall be paid by Contractor as provided for herein.
- C. Actual or alleged knowledge by the Owner, A/E, and/or inspector(s), prior to acceptance of all work by the Owner, of defects or deficiencies in the Work shall not, in any way, affect or diminish the guarantee by the Contractor. The guarantee shall apply to all elements and parts of the Work, regardless of knowledge by the Owner, A/E and inspector(s) of defects or deficiencies and regardless of failure of the Owner, A/E and/or inspector(s) to inform the Contractor of known or suspected defects or deficiencies prior to Final Acceptance of the Work by the Owner.
- D. All subcontractors', manufacturers', and suppliers' warranties and guarantees, express or implied, for any part of the Work, materials and equipment shall be deemed obtained and shall be enforced by the Contractor for the benefit of the Owner without the necessity of formal transfer or assignment thereof. Warranties and guarantees by subcontractors, manufacturers, and suppliers shall be in force for the periods required by the Contract Documents.
- E. Nothing contained in this section shall defeat or impair the right of persons furnishing materials or labor to recover under any bond given by the Contractor for their protection, or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the Owner.
- F. The provisions of this section shall be inserted in all subcontracts and material contracts, and notice of its provisions shall be given to all persons furnishing materials for the Work when no formal contract is entered into for such materials.
- G. With respect to all warranties, express or implied, for Work performed or materials furnished according to the Contract Documents, Contractor shall:
1. Obtain all warranties that would be given in normal commercial practice;
 2. Require all warranties to be executed, in writing, for the benefit of Owner;
 3. Enforce all warranties for the benefit of Owner, if directed by Owner; and
 4. Be responsible to enforce any Subcontractor's, manufacturer's, or supplier's warranty should they extend beyond the period specified in the Contract Documents.
- H. The obligations under this section shall survive Final Acceptance.

5.22 INDEMNIFICATION

- A. Contractor shall defend, indemnify, and hold Owner and A/E harmless from and against all claims, demands, losses, damages, or costs, including but not limited to damages, including but not limited to attorney's fees, litigation expenses, dispute resolution expenses, court costs, and the cost of appellate proceedings arising out of bodily injury or death to persons and damage to property, caused by or resulting from:
1. The sole negligence or intentional acts of Contractor or any of its Subcontractors;
 2. The concurrent negligence of Contractor or any party it is responsible for including its Subcontractor, but only to the extent of the negligence of Contractor or any party it is responsible for including its Subcontractor; and
 3. The use of any design, process, or equipment which constitutes an infringement of any United States patent presently issued, or violates any other proprietary interest, including copyright, trademark, and trade secret, except when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents.

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- B. In any action against Owner and any other entity indemnified in accordance with this section, by any employee of Contractor, its Subcontractors, Sub-subcontractors, agents, or anyone directly or indirectly employed by any of them, the indemnification obligation of this section shall not be limited by a limit on the amount or type of damages, compensation, or benefits payable by or for Contractor or any Subcontractor under RCW Title 51, the Industrial Insurance Act, or any other employee benefit acts. In addition, Contractor waives immunity as to Owner and A/E only, in accordance with RCW Title 51. This waiver is an expressly negotiated term in this Contract.

PART 6 - PAYMENTS AND COMPLETION

6.01 CONTRACT SUM

Owner shall pay Contractor the Contract Sum for performance of the Work, in accordance with the Contract Documents. The Contract Sum shall include all taxes imposed by law and properly chargeable to the Project, including sales tax.

6.02 SCHEDULE OF VALUES

Before submitting its first Application for Payment, Contractor shall submit to Owner for approval a breakdown allocating the total Contract Sum to each principal category of work, in such detail as requested by Owner ("Schedule of Values"). The approved Schedule of Values shall include appropriate amounts for demobilization, record drawings, O&M manuals, spare parts, training, and any other requirements for Project closeout, and shall be used by Owner as the basis for progress payments. Should the Owner reject the proposed Schedule of Values due to front end loading, failure to include the items described above or other deficiencies, the Owner shall identify the defects in the proposed Schedule of Values and Contractor shall submit a revised Schedule of Values within three working days thereafter. Payment for Work shall be made only for and in accordance with those items included in the approved Schedule of Values.

6.03 APPLICATION FOR PAYMENT

- A. At monthly intervals, unless determined otherwise by Owner, Contractor shall submit to Owner an itemized Application for Payment for Work completed in accordance with the Contract Documents and the approved Schedule of Values. Each application shall be supported by such substantiating data as Owner may require.
- B. By submitting an Application for Payment, Contractor is certifying that all Subcontractors have been paid, less earned retainage in accordance with RCW 60.28, as their interests appeared in the last preceding certificate of payment. By submitting an Application for Payment, Contractor is recertifying that the representations set forth in section 1.03 are true and correct, to the best of Contractor's knowledge, as of the date of the Application for Payment.
- C. At the time it submits an Application for Payment, Contractor shall analyze and reconcile, to the satisfaction of Owner, the actual progress of the Work with the Progress Schedule.
- D. If authorized by Owner, the Application for Payment may include request for payment for material delivered to the Project site and suitably stored, or for completed preparatory work. Payment may similarly be requested for material stored off the Project site, provided Contractor complies with or furnishes satisfactory evidence of the following:
1. The material will be placed in a warehouse that is structurally sound, dry, lighted and suitable for the materials to be stored;
 2. The warehouse is located within a 10-mile radius of the Project. Other locations may be utilized, if approved in writing, by Owner;
 3. Only materials for the Project are stored within the warehouse (or a secure portion of a warehouse set aside for the Project);
 4. Contractor furnishes Owner a certificate of insurance extending Contractor's insurance coverage for damage, fire, and theft to cover the full value of all materials stored, or in transit;

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5. The warehouse (or secure portion thereof) is continuously under lock and key, and only Contractor's authorized personnel shall have access;
6. Owner shall at all times have the right of access to the storage areas in company of Contractor;
7. Contractor and its surety assume total responsibility for the stored materials; and
8. Contractor furnishes to Owner certified lists of materials stored, bills of lading, invoices, and other information as may be required, and shall also furnish notice to Owner when materials are moved from storage to the Project site.

6.04 PROGRESS PAYMENTS

- A. Owner shall make progress payments, in such amounts as Owner determines are properly due, within 30 days after receipt of a properly executed and approved Application for Payment. Owner shall notify Contractor in accordance with RCW 39.76 if the Application for Payment does not comply with the requirements of the Contract Documents.
- B. Issued progress payments for any part of the Work shall not be used as evidence of performance or quantities. Progress payments serve only as a basis for partial payments. The Owner may revise progress payments any time before Final Acceptance. If the Owner deems it proper to do so, changes may be made in progress payments and in the final estimate.
- C. Owner shall retain 5% of the amount of each progress payment until 45 days after Final Acceptance and receipt of all documents required by law or the Contract Documents, including, at Owner's request, consent of surety to release of the retainage. In accordance with RCW 60.28, Contractor may request that monies reserved be retained in a fund by Owner, deposited by Owner in a bank or savings and loan, or placed in escrow with a bank or trust company to be converted into bonds and securities to be held in escrow with interest to be paid to Contractor, or provide a retainage bond. Retainage Bond shall be executed on the template form provided in the Contract Documents.
- D. Title to all Work and materials covered by a progress payment shall pass to Owner at the time of such payment free and clear of all liens, claims, security interests, and encumbrances. Passage of title shall not, however, relieve Contractor from any of its duties and responsibilities for the Work or materials, or waive any rights of Owner to insist on full compliance by Contractor with the Contract Documents.
- E. Payments due and unpaid in accordance with the Contract Documents shall bear interest as specified in RCW 39.76.

6.05 PAYMENTS WITHHELD

- A. Owner may withhold, reduce, or, on account of subsequently discovered evidence, nullify the whole or part of any payment to such extent as may be necessary to protect Owner from loss or damage for reasons including but not limited to:
 1. Work not in accordance with the Contract Documents;
 2. Reasonable evidence that the Work required by the Contract Documents cannot be completed for the unpaid balance of the Contract Sum;
 3. Work by Owner to correct defective Work or complete the Work in accordance with section 5.17;
 4. Failure to perform in accordance with the Contract Documents;
 5. Cost or liability that may occur to Owner as the result of Contractor's fault or negligent acts or omissions;
 6. Liquidated Damages and Actual Damages in accordance with section 3.07;
 7. Expenses incurred by the Owner for reviewing multiple resubmittals in accordance with section 4.03;

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8. Expenses incurred by the Owner for reviewing substitute items in accordance with section 5.13;
 9. Claims made against Owner on account of Contractor's performance or furnishing of Work; or
 10. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens.
- B. In any case where part or all of a payment is going to be withheld for unsatisfactory performance, Owner shall notify Contractor in accordance with RCW 39.76.

6.06 RETAINAGE AND BOND CLAIM RIGHTS

RCW chapters 39.08 and 60.28, concerning the rights and responsibilities of Contractor and Owner with regard to the performance and payment bonds and retainage, are made a part of the Contract Documents by reference as though fully set forth herein.

6.07 SUBSTANTIAL COMPLETION

Substantial Completion is the stage in the progress of the Work (or portion thereof designated and approved by Owner) when the construction is sufficiently complete, in accordance with the Contract Documents, so Owner can fully occupy the Work (or the designated portion thereof) for the use for which it is intended. All Work other than incidental corrective or punch list work shall be completed. Substantial Completion shall not have been achieved if all systems and parts are not functional, if utilities are not connected and operating normally, if all required occupancy permits have not been issued, or if the Work is not accessible by normal vehicular and pedestrian traffic routes. The date Substantial Completion is achieved shall be established in writing by Owner. Contractor may request an early date of Substantial Completion which must be approved by Change Order. Owner's occupancy of the Work or designated portion thereof does not necessarily indicate that Substantial Completion has been achieved. Owner shall have the right to exclude Contractor from the Project site after the date of Substantial Completion subject to allowing the Contractor reasonable access to remove its property and complete or correct items necessary to obtain Final Completion.

6.08 PAYROLL RECORDS

- A. In accordance with RCW 39.12.120, each contractor, subcontractor, or employer shall keep accurate payroll records for three years from the date of acceptance of the public works project by the contract awarding agency, showing the employee's full name, address, social security number, trade or occupation, classification, straight and overtime rates, hourly rate of usual benefits, and hours worked each day and week, including any employee authorizations executed pursuant to RCW 49.28.065, and the actual gross wages, itemized deductions, withholdings, and net wages paid, for each laborer, worker, and mechanic employed by the contractor for work performed on a public works project.
- B. A contractor, subcontractor, or employer shall file a copy of its certified payroll records using the department of labor and industries' online system at least once per month. If the department of labor and industries' online system is not used, a contractor, subcontractor, or employer shall file a copy of its certified payroll records directly with the department of labor and industries in a format approved by the department of labor and industries at least once per month.
- C. A contractor, subcontractor, or employer's noncompliance with this section constitutes a violation of RCW 39.12.050.

6.09 PRIOR OCCUPANCY

- A. Owner may, upon written notice thereof to Contractor, take possession of or use any completed or partially completed portion of the Work ("Prior Occupancy") at any time prior to Substantial Completion. Unless otherwise agreed in writing, Prior Occupancy shall not: be deemed an acceptance of any portion of the Work; accelerate the time for any payment to Contractor; prejudice any rights of Owner provided by any insurance, bond, guaranty, or the Contract

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Documents; relieve Contractor of the risk of loss or any of the obligations established by the Contract Documents; establish a date for termination or partial termination of the assessment of liquidated damages; or constitute a waiver of claims.

- B. Notwithstanding anything in the preceding paragraph, Owner shall be responsible for loss of or damage to the Work resulting from Prior Occupancy. Contractor's one year duty to repair and any system warranties shall begin on building systems activated and used by Owner as agreed in writing by Owner and Contractor.

6.10 FINAL COMPLETION, ACCEPTANCE, AND PAYMENT

- A. Final Completion shall be achieved when the Work is fully and finally complete in accordance with the Contract Documents. The date Final Completion is achieved shall be established by Owner in writing.
- B. Final Acceptance is the formal action of Owner acknowledging Final Completion. Prior to Final Acceptance, Contractor shall, in addition to all other requirements in the Contract Documents, submit to Owner a written notice of any outstanding disputes or claims between Contractor and any of its Subcontractors, including the amounts and other details thereof. The final Application for Payment shall be accompanied by consent of the surety, if any to final payment, a list of all Claims against Owner that Contractor believes are unsettled, and complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of Liens filed in connection with the Work. In lieu of said Lien releases or waivers, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien. Neither Final Acceptance, nor final payment, shall release Contractor or its sureties from any obligations of these Contract Documents or the Public Works Bond, or constitute a waiver of any claims by Owner arising from Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Acceptance of final payment by Contractor, or any Subcontractor, shall constitute a waiver and release to Owner of all claims by Contractor, or any such Subcontractor, for an increase in the Contract Sum or the Contract Time, and for every act or omission of Owner relating to or arising out of the Work, except for those Claims made in accordance with the procedures, including the time limits, set forth in part 8.

PART 7 – CHANGES TO THE CONTRACT

7.01 CHANGE IN THE WORK

- A. Owner may, at any time and without notice to Contractor's surety, order additions, deletions, revisions, or other changes in the Work. These changes in the Work shall be incorporated into the Contract Documents through the execution of Change Orders. If any change in the Work ordered by Owner causes an increase or decrease in the Contract Sum or the Contract Time, an equitable adjustment shall be made as provided in section 7.02 or 7.03, respectively, and such adjustment(s) shall be incorporated into a Change Order.
- B. If Owner desires to order a change in the Work, it may request a written Change Order proposal from Contractor. Contractor shall submit a Change Order proposal within 14 days of the request from Owner, or within such other period as mutually agreed. Contractor's Change Order proposal shall be full compensation for implementing the proposed change in the Work, including any adjustment in the Contract Sum or Contract Time, and including compensation for all delays in connection with such change in the Work and for any expense or inconvenience, disruption of schedule, or loss of efficiency or productivity occasioned by the change in the Work.
- C. Upon receipt of the Change Order proposal, or a request for equitable adjustment in the Contract Sum or Contract Time, or both, as provided in sections 7.02 and 7.03, Owner may accept or reject the proposal, request further documentation, or negotiate acceptable terms with Contractor. Pending agreement on the terms of the Change Order, Owner may direct Contractor to proceed immediately with the Change Order Work. Contractor shall not proceed with any change in the Work until it has obtained Owner's written approval. All Work done pursuant to any Owner-directed change in the Work shall be executed in accordance with the Contract Documents.
- D. If Owner and Contractor reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, such agreement shall be incorporated in a Change Order. The Change Order shall constitute full payment and final settlement of all claims for time and for direct, indirect, and consequential costs,

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including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity, related to any Work either covered or affected by the Change Order, or related to the events giving rise to the request for equitable adjustment.

- E. If Owner and Contractor are unable to reach agreement on the terms of any change in the Work, including any adjustment in the Contract Sum or Contract Time, Contractor may at any time in writing, request a final offer from Owner. Owner shall provide Contractor with its written response within 30 days of Contractor's request. Owner may also provide Contractor with a final offer at any time. If Contractor rejects Owner's final offer, or the parties are otherwise unable to reach agreement, Contractor's only remedy shall be to file a Claim as provided in part 8.
- F. A Field Authorization (FA) may be executed as a directive to proceed with work when the processing time for an approved change order would impact the project.
 - 1. A scope of work must be defined, a maximum not to exceed cost agreed upon, and any estimated modification to the contract completion time determined. The method of final cost verification must be noted and supporting cost data must be submitted in accordance with the requirements of Part 7 of the General Conditions. Upon satisfactory submittal and approval of supporting cost data, the completed FA will be processed into a change order. No payment will be made to the Contractor for FA work until that FA is converted to a Change Order.

7.02 CHANGE IN THE CONTRACT SUM

A. General Application

- 1. The Contract Sum shall only be changed by a Change Order. Contractor shall include any request for a change in the Contract Sum in its Change Order proposal.
- 2. If the cost of Contractor's performance is changed due to the fault or negligence of Owner, or anyone for whose acts Owner is responsible, Contractor shall be entitled to make a request for an equitable adjustment in the Contract Sum in accordance with the following procedure. No change in the Contract Sum shall be allowed to the extent: Contractor's changed cost of performance is due to the fault or negligence of Contractor, or anyone for whose acts Contractor is responsible; the change is concurrently caused by Contractor and Owner; or the change is caused by an act of Force Majeure as defined in Section 3.05.
 - a. A request for an equitable adjustment in the Contract Sum shall be based on written notice delivered to Owner within 7 days of the occurrence of the event giving rise to the request. For purposes of this part, "occurrence" means when Contractor knew, or in its diligent prosecution of the Work should have known, of the event giving rise to the request. If Contractor believes it is entitled to an adjustment in the Contract Sum, Contractor shall immediately notify Owner and begin to keep and maintain complete, accurate, and specific daily records. Contractor shall give Owner access to any such records and, if requested shall promptly furnish copies of such records to Owner.
 - b. Contractor shall not be entitled to any adjustment in the Contract Sum for any occurrence of events or costs that occurred more than 7 days before Contractor's written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the Contract Sum; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Sum requested. **Failure to properly give such written notice shall constitute a waiver of Contractor's right to an equitable adjustment.**
 - c. Within 30 days of the occurrence of the event giving rise to the request, unless Owner agrees in writing to allow an additional period of time to ascertain more accurate data, Contractor shall supplement the written notice provided in accordance with subparagraph a. above with additional supporting data. Such additional data shall include, at a minimum: the amount of compensation requested, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that Contractor suffered the damages claimed, but that the damages claimed were actually a result of the act, event, or condition complained of and that the Contract Documents provide entitlement to an equitable adjustment to Contractor for such act, event, or condition; and documentation sufficiently detailed to permit an informed

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analysis of the request by Owner (collectively "Additional Information"). When the request for compensation relates to a delay, or other change in Contract Time, Contractor shall demonstrate the impact on the critical path, in accordance with section 7.03C. If the impacts arising out of the occurrence are ongoing, Contractor shall supplement the Additional Information every thirty (30) days after the initial submission and will continue to do so every thirty (30) days until the occurrence is no longer impacting the Contractor. **Failure to provide the Additional Information within the time allowed or within the format required shall constitute a waiver of Contractor's right to an equitable adjustment.**

- d. Pending final resolution of any request made in accordance with this section, unless otherwise agreed in writing, Contractor shall proceed diligently with performance of the Work.
 - e. Any requests by Contractor for an equitable adjustment in the Contract Sum and in the Contract Time that arise out of the same event(s) shall be submitted together.
3. The value of any Work covered by a Change Order, or of any request for an equitable adjustment in the Contract Sum, shall be determined by one of the following methods:
- a. On the basis of a fixed price as determined in paragraph 7.02B.
 - b. By application of unit prices to the quantities of the items involved as determined in paragraph 7.02C.
 - c. On the basis of time and material as determined in paragraph 7.02D.
4. When Owner has requested Contractor to submit a Change Order proposal, Owner may direct Contractor as to which method in subparagraph 3. above to use when submitting its proposal. Otherwise, Contractor shall determine the value of the Work, or of a request for an equitable adjustment, on the basis of the fixed price method.

B. Change Order Pricing -- Fixed Price

When the fixed price method is used to determine the value of any Work covered by a Change Order, or of a request for an equitable adjustment in the Contract Sum, the following procedures shall apply:

- 1. Contractor's Change Order proposal, or request for adjustment in the Contract Sum, shall be accompanied by a complete itemization of the costs, including labor, material, subcontractor costs, and overhead and profit. The costs shall be itemized in the manner set forth below, and shall be submitted on breakdown sheets in a form approved by Owner.
- 2. All costs shall be calculated based upon appropriate industry standard methods of calculating labor, material quantities, and equipment costs.
- 3. If any of Contractor's pricing assumptions are contingent upon anticipated actions of Owner, Contractor shall clearly state them in the proposal or request for an equitable adjustment.
- 4. The cost of any additive or deductive changes in the Work shall be calculated as set forth below, except that overhead and profit shall not be included on deductive changes in the Work. Where a change in the Work involves additive and deductive work by the same Contractor or Subcontractor, small tools, overhead, profit, bond and insurance markups will apply to the net difference.
- 5. Any request for adjustment of Contract Sum based upon the fixed price method shall include only the following items:
 - a. Craft labor costs: These are the labor costs determined by multiplying the estimated or actual additional number of craft hours needed to perform the change in the Work by the hourly labor costs. Craft hours should cover direct labor, as well as indirect labor due to trade inefficiencies. The hourly costs shall be based on the following:

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- (1) Basic wages and benefits: Hourly rates and benefits as stated on the Department of Labor and Industries approved "statement of intent to pay prevailing wages." Direct supervision shall be a reasonable percentage not to exceed 15% of the cost of direct labor. No supervision markup shall be allowed for a working supervisor's hours.
 - (2) Worker's insurance: Direct contributions to the state of Washington for industrial insurance; medical aid; and supplemental pension, by the class and rates established by the class and rates established by the Department of Labor and Industries.
 - (3) Federal insurance: Direct contributions required by the Federal Insurance Compensation Act; Federal Unemployment Tax Act; and the State Unemployment Compensation Act.
 - (4) Travel allowance: Travel allowance and/or subsistence, if applicable, not exceeding those allowances established by regional labor union agreements, which are itemized and identified separately.
 - (5) Safety: Cost incurred due to the Washington Industrial Safety and Health Act, which shall be a reasonable percentage not to exceed 2% of the sum of the amounts calculated in (1), (2), and (3) above.
- b. Material costs: This is an itemization of the quantity and cost of materials needed to perform the change in the Work. Material costs shall be developed first from actual known costs, second from supplier quotations or if these are not available, from standard industry pricing guides. Material costs shall consider all available discounts. Freight costs, express charges, or special delivery charges, shall be itemized.
- c. Equipment costs: This is an itemization of the type of equipment and the estimated or actual length of time the construction equipment appropriate for the Work is or will be used on the change in the Work. Costs will be allowed for construction equipment only if used solely for the changed Work, or for additional rental costs actually incurred by the Contractor. Equipment charges shall be computed on the basis of actual invoice costs or if owned, from the current edition of one of the following sources:
- (1) Equipment rates shown in the publication entitled "Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership)" most current edition on the Contract execution date published by State of California, California State Transportation Agency, Department of Transportation, Division of Construction. (Online link <http://www.dot.ca.gov/hq/construc/equipmnt.html>)
 - (2) The National Electrical Contractors Association for equipment used on electrical work.
 - (3) The Mechanical Contractors Association of America for equipment used on mechanical work.
- (4) In the event equipment rates are not listed in the above sources (1 – 3), the closest match of similar equipment shown in those above sources (1 – 3) as determined by the Owner will be used as the basis for establishing equipment rates.
- (5) The maximum rate for standby equipment shall not exceed that shown in the equipment rates shown in the publication entitled "Labor Surcharge and Equipment Rental Rates (Cost of Equipment Ownership)" most current edition on the Contract execution date published by State of California, California State Transportation Agency, Department of Transportation, Division of Construction.
- d. Allowance for small tools, expendables & consumable supplies: Small tools consist of tools which cost \$250 or less and are normally furnished by the performing contractor. The maximum rate for small tools shall not exceed the following:
- (1) For Contractor, 3% of direct labor costs.

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- (2) For Subcontractors, 5% of direct labor costs. Expendables and consumable supplies directly associated with the change in Work must be itemized.
- e. Subcontractor costs: This is defined as payments Contractor makes to Subcontractors for changed Work performed by Subcontractors of any tier. The Subcontractors' cost of Work shall be calculated and itemized in the same manner as prescribed herein for Contractor.
- f. Allowance for overhead: This is defined as costs of any kind attributable to direct and indirect delay, acceleration, or impact, added to the total cost to Owner of any change in the Contract Sum but not to the cost of any change in the Contract Time for which Contractor has been compensated pursuant to the conditions set forth in Section 7.03. This allowance shall compensate Contractor for all noncraft labor, temporary construction facilities, field engineering, schedule updating, as-built drawings, home office cost, B&O taxes, office engineering, estimating costs, additional overhead because of extended time, and any other cost incidental to the change in the Work. It shall be strictly limited in all cases to a reasonable amount, mutually acceptable, or if none can be agreed upon to an amount not to exceed the rates below:
- (1) For Contractor, for any Work actually performed by Contractor's own forces, 15% of the first \$50,000 of the cost, and 4% of the remaining cost, if any.
- (2) For each Subcontractor (including lower tier subcontractors), for any Work actually performed by its own forces, 15% of the first \$50,000 of the cost, and 4% of the remaining cost, if any.
- (3) For Contractor, for any work performed by its Subcontractor(s), 6% of the first \$50,000 of the amount due each Subcontractor, and 4% of the remaining amount if any.
- (4) For each Subcontractor, for any Work performed by its Subcontractor(s) of any lower tier, 4% of the first \$50,000 of the amount due the sub-Subcontractor, and 2% of the remaining amount if any.
- (5) The cost to which overhead is to be applied shall be determined in accordance with subparagraphs (1) through (4) above.
- g. Allowance for profit: This is an amount to be added to the cost of any change in Contract Sum, but not to the cost of change in Contract Time for which Contractor has been compensated pursuant to the conditions set forth in section 7.03. It shall be limited to a reasonable amount, mutually acceptable, or if none can be agreed upon, to an amount not to exceed the rates below:
- (1) For Contractor or Subcontractor of any tier for work performed by their forces, 6% of the cost developed in accordance with 7.02 B. 5a.-e. above.
- (2) For Contractor or Subcontractor of any tier for work performed by a subcontractor of a lower tier, 4% of the Subcontractor cost developed in accordance with 7.02 B. 5a.-h.
- h. Cost of change in insurance or bond premium: This is defined as:
- (1) Contractor's liability insurance: The cost of any changes in Contractor's liability insurance arising directly from execution of the Change Order; and
- (2) Public works bond: The cost of the additional premium for Contractor's bond arising directly from the changed Work.

The costs of any change in insurance or bond premium shall be added after overhead and allowance for profit are calculated in accordance with subparagraph f. and g. above.

C. Change Order Pricing -- Unit Prices

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1. Whenever Owner authorizes Contractor to perform Work on a Unit Price basis, Owner's authorization shall clearly state:
 - a. Scope of work to be performed;
 - b. Type of reimbursement including pre-agreed rates for material quantities; and
 - c. Cost limit of reimbursement.
2. Contractor shall:
 - a. Cooperate with Owner and assist in monitoring the Work being performed. As requested by Owner, Contractor shall identify workers assigned to the Change Order Work and areas in which they are working;
 - b. Leave access as appropriate for quantity measurement; and
 - c. Not exceed any cost limit(s) without Owner's prior written approval.
3. Contractor shall submit costs in accordance with paragraph 7.02B. and satisfy the following requirements:
 - a. Unit prices shall include reimbursement for all direct and indirect costs of the Work, including overhead and profit, and bond and insurance costs; and
 - b. Quantities must be supported by field measurement statements signed by Owner.

D. Change Order Pricing -- Time-and-Material Prices

1. Whenever Owner authorizes Contractor to perform Work on a time-and-material basis, Owner's authorization shall clearly state:
 - a. Scope of Work to be performed;
 - b. Type of reimbursement including pre-agreed rates, if any, for material quantities, equipment and/or labor; and
 - c. Cost limit of reimbursement
2. Contractor shall:
 - a. Cooperate with Owner and assist in monitoring the Work being performed. As requested by Owner, identify workers assigned to the Change Order Work and areas in which they are working;
 - b. Identify on daily time sheets all labor performed in accordance with this authorization. Contractor shall submit copies of daily time sheets within 2 working days for Owner's review. Owner or A/E shall approve accuracy of each daily time sheet;
 - c. Leave access as appropriate for quantity measurement;
 - d. Perform all Work in accordance with this section as efficiently as possible; and
 - e. Not exceed any cost limit(s) without Owner's prior written approval.
3. Contractor shall submit costs in accordance with paragraph 7.02B and additional verification supported by:
 - a. Labor and equipment usage detailed on daily time sheets; and

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- b. Invoices for material.

7.03 CHANGE IN THE CONTRACT TIME

- A. The Contract Time shall only be changed by a Change Order. Contractor shall include any request for a change in the Contract Time in its Change Order proposal.
- B. If the time of Contractor's performance is changed due to an act of Force Majeure, or due to the fault or negligence of Owner or anyone for whose acts Owner is responsible, Contractor shall be entitled to make a request for an equitable adjustment in the Contract Time in accordance with the following procedure. No adjustment in the Contract Time shall be allowed to the extent Contractor's changed time of performance is due to the fault or negligence of Contractor, or anyone for whose acts Contractor is responsible.
 - 1. A request for an equitable adjustment in the Contract Time shall be based on written notice delivered within 7 days of the occurrence of the event giving rise to the request. If Contractor believes it is entitled to adjustment of Contract Time, Contractor shall immediately notify Owner and begin to keep and maintain complete, accurate, and specific daily records. Contractor shall give Owner access to any such record and if requested, shall promptly furnish copies of such record to Owner.
 - 2. Contractor shall not be entitled to an adjustment in the Contract Time for any events that occurred more than 7 days before Contractor's written notice to Owner. The written notice shall set forth, at a minimum, a description of: the event giving rise to the request for an equitable adjustment in the Contract Time; the nature of the impacts to Contractor and its Subcontractors of any tier, if any; and to the extent possible the amount of the adjustment in Contract Time requested. Failure to properly give such written notice shall, to the extent Owner's interests are prejudiced, constitute a waiver of Contractor's right to an equitable adjustment.
 - 3. Within 30 days of the occurrence of the event giving rise to the request, unless Owner agrees in writing to allow an additional period of time to ascertain more accurate data, Contractor shall supplement the written notice provided in accordance with subparagraph 7.03B.2 with additional supporting data. Such additional data shall include, at a minimum: the amount of delay claimed, itemized in accordance with the procedure set forth herein; specific facts, circumstances, and analysis that confirms not only that Contractor suffered the delay claimed, but that the delay claimed was actually a result of the act, event, or condition complained of, and that the Contract Documents provide entitlement to an equitable adjustment in Contract Time for such act, event, or condition; and supporting documentation sufficiently detailed to permit an informed analysis of the request by Owner (collectively "Additional Scheduling Information"). If the impacts arising out of the occurrence are ongoing, Contractor shall supplement the Additional Scheduling Information every thirty (30) days after the initial submission and will continue to do so every thirty (30) days until the occurrence is no longer impacting the Contractor. **Failure to provide the Additional Scheduling Information within the time allowed or within the format required shall constitute a waiver of Contractor's right to an equitable adjustment.**
 - 4. Pending final resolution of any request in accordance with this paragraph, unless otherwise agreed in writing, Contractor shall proceed diligently with performance of the Work.
- C. Any change in the Contract Time covered by a Change Order, or based on a request for an equitable adjustment in the Contract Time, shall be limited to the change in the critical path of Contractor's schedule attributable to the change of Work or event(s) giving rise to the request for equitable adjustment. Any Change Order proposal or request for an adjustment in the Contract Time shall demonstrate the impact on the critical path of the schedule. Contractor shall be responsible for showing clearly on the Progress Schedule that the change or event: had a specific impact on the critical path, and except in case of concurrent delay, was the sole cause of such impact; and could not have been avoided by re-sequencing of the Work or other reasonable alternatives.
- D. Contractor may request compensation for the cost of a change in Contract Time in accordance with this paragraph, 7.03D, subject to the following conditions:
 - 1. The change in Contract Time shall solely be caused by the fault or negligence of Owner or A/E;

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2. Compensation under this paragraph is limited to changes in Contract Time for which Contractor is not entitled to be compensated under section 7.02;
3. Contractor shall follow the procedure set forth in paragraph 7.03B;
4. Contractor shall establish the extent of the change in Contract Time in accordance with paragraph 7.03C; and
5. The daily cost of any change in Contract Time shall be limited to the items below, less funds that may have been paid pursuant to a change in the Contract Sum that contributed to this change in Contract Time:
 - a. cost of nonproductive field supervision or labor extended because of the delay;
 - b. cost of weekly meetings or similar indirect activities extended because of the delay,
 - c. cost of temporary facilities or equipment rental extended because of the delay;
 - d. cost of insurance extended because of the delay;
 - e. general and administrative overhead in an amount to be agreed upon, but not to exceed 3% of Contract Sum divided by the Contract Time for each day of the delay.

PART 8 - CLAIMS AND DISPUTE RESOLUTION

8.01 CLAIMS PROCEDURE

- A. Disputes and Claims. When disputes occur during a contract, the Contractor shall pursue resolution through the A/E. Any claims shall be submitted as required for a Notice to the A/E, with a copy to the Owner. The Contractor shall follow the procedures outlined in Sections 7.02 and 7.03. If the negotiation fail to provide satisfactory resolution, the Contractor shall pursue the more formalized method outlined in WSDOT Section 1-09.11(2) Claims, for submitting a claim. Claims submitted by the Contractor under WSDOT Section 1-09.11(2) shall be submitted within 14 calendar days after the conclusion of the negotiation procedures the A/E has declared in impasse in writing. **By failing to submit a claim in accordance with this timeline, the Contractor waives any additional entitlement for the protested work and accepts from the A/E any written or oral order (including direction, instruction, interpretations, and determinations).**
- B. Time Limitation and Jurisdiction Regarding the Contractor's Right to Seek Judicial Relief – For the convenience of the parties to the Contract it is mutually agreed by the parties that any demand for which the Contractor has initiated against the Owner arising from this Contract shall be brought within one hundred and twenty (120) calendar days from the date of Substantial Completion; and it is further agreed that any such claims or causes of action shall be brought only in the Superior Court of Whatcom County. **The parties understand and agree that the Contractor's failure to bring suit within the time period provided, shall be a complete bar to any such claims or causes of action.** It is further mutually agreed by the parties that when any claims or causes of action which the Contractor asserts against the Owner arising from the Contract are filed with Owner or initiated in court, the Contractor shall permit the Owner to have timely access to any records deemed necessary by the Owner to assist in evaluating the claim or action.
- C. Mediation. Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 6.09 C, 8.03 A, 7.02 A (2) (b & C), 7.03 B (2 & 3) and 8.01 A shall be subject to mediation as a condition precedent to binding arbitration or litigation.
 1. The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise. A request for mediation shall be made in writing, delivered to the other party to the Contract. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of the request, unless stayed for a longer period by agreement of

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the parties. If arbitration is stayed pursuant to this Section, the parties may nonetheless proceed to the selection of the arbitrator and agree upon a schedule for later proceedings.

2. If the parties are unable to agree upon the mediator, the parties will each submit the names of three attorneys practicing in Western Washington with at least 25 years of experience in construction law to the Whatcom County Presiding Judge who, acting in a non-judicial capacity, shall select the mediator. The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in Bellingham, Washington, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

- D. Arbitration. Owner, in its sole discretion, may choose to submit any Claim not resolved by mediation to private arbitration to be held in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement; however, irrespective of the size of the dispute, the arbitration proceedings will be conducted by a single arbitrator. Owner will notify Contractor of its election for the Claim(s) to be resolved by private arbitration. If the matter is submitted to private arbitration, the parties will, in their respective notice of demand for arbitration identify all Claims then known to that party to be arbitrated.
1. In the event the Owner elects arbitration, the demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event later than the time allowed in Section 8.01 B.
 2. If the parties are unable to agree upon the arbitrator, the parties will each submit the names of three attorneys practicing in Western Washington with at least 25 years of experience in construction law to the Whatcom County Presiding Judge who, acting in a non-judicial capacity and consistent with RCW 7.04A.110, shall select the arbitrator. Venue for any such arbitration shall be in Bellingham, Washington.
 3. The award rendered by the arbitrator shall be final, and judgment may be entered upon it in accordance with applicable law in Whatcom County Superior Court.
 4. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.
 5. Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).
- E. Litigation. In the event Owner does not elect to arbitrate any Claims or disputes, they shall be resolved in litigation with venue of any such dispute in the Whatcom County Superior Court.
- F. Attorneys' Fees. The substantially prevailing party as defined in Section 10.10 shall be awarded its attorney's fees, costs and expert witness's fees, along with all arbitrator fees, if applicable, incurred at arbitration, trial, appeals and collections.

8.02 CLAIMS AUDITS

- A. All Claims filed against Owner shall be subject to audit at any time following the filing of the Claim. Failure of Contractor, or Subcontractors of any tier, to maintain and retain sufficient records to allow Owner to verify all or a portion of the Claim or to permit Owner access to the books and records of Contractor, or Subcontractors of any tier, shall constitute a waiver of the Claim and shall bar any recovery.
- B. In support of Owner audit of any Claim, Contractor shall, upon request, promptly make available to Owner the following documents:
1. Daily time sheets and supervisor's daily reports;

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2. Collective bargaining agreements;
3. Insurance, welfare, and benefits records;
4. Payroll registers;
5. Earnings records;
6. Payroll tax forms;
7. Material invoices, requisitions, and delivery confirmations;
8. Material cost distribution worksheet;
9. Equipment records (list of company equipment, rates, etc.);
10. Vendors', rental agencies', Subcontractors', and agents' invoices;
11. Contracts between Contractor and each of its Subcontractors, and all lower-tier Subcontractor contracts and supplier contracts;
12. Subcontractors' and agents' payment certificates;
13. Cancelled checks (payroll and vendors);
14. Job cost report, including monthly totals;
15. Job payroll ledger;
16. Planned resource loading schedules and summaries;
17. General ledger;
18. Cash disbursements journal;
19. Financial statements for all years reflecting the operations on the Work. In addition, the Owner may require, if it deems it appropriate, additional financial statements for 3 years preceding execution of the Work;
20. Depreciation records on all company equipment whether these records are maintained by the company involved, its accountant, or others;
21. If a source other than depreciation records is used to develop costs for Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents;
22. All nonprivileged documents which relate to each and every Claim together with all documents which support the amount of any adjustment in Contract Sum or Contract Time sought by each Claim;
23. Work sheets or software used to prepare the Claim establishing the cost components for items of the Claim including but not limited to labor, benefits and insurance, materials, equipment, Subcontractors, all documents which establish the time periods, individuals involved, the hours for the individuals, and the rates for the individuals; and
24. Work sheets, software, and all other documents used by Contractor to prepare its bid.

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- C. The audit may be performed by employees of Owner or a representative of Owner. Contractor, and its Subcontractors, shall provide adequate facilities acceptable to Owner, for the audit during normal business hours. Contractor, and all Subcontractors, shall make a good faith effort to cooperate with Owner's auditors.

PART 9 - TERMINATION OF THE WORK

9.01 TERMINATION BY OWNER FOR CAUSE

- A. Owner may, upon 7 days written notice to Contractor and to its surety, terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for cause upon the occurrence of any one or more of the following events:
1. Contractor fails to prosecute the Work or any portion thereof with sufficient diligence to ensure Substantial Completion of the Work within the Contract Time;
 2. Contractor is adjudged bankrupt, makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency;
 3. Contractor fails in a material way to replace or correct Work not in conformance with the Contract Documents;
 4. Contractor repeatedly fails to supply skilled workers or proper materials or equipment;
 5. Contractor repeatedly fails to make prompt payment due to Subcontractors or for labor;
 6. Contractor materially disregards or fails to comply with Laws and Regulations or orders of any public authority having jurisdiction; or
 7. Contractor repeatedly disregards authority of the A/E
 8. Contractor is otherwise in material breach of any provision of the Contract Documents.
- B. Upon termination, Owner may at its option:
1. Take possession of the Project site and take possession of or use all materials, equipment, tools, and construction equipment and machinery thereon owned by Contractor to maintain the orderly progress of, and to finish, the Work;
 2. Accept assignment of subcontracts pursuant to section 5.21; and
 3. Finish the Work by whatever other reasonable method it deems expedient.
- C. Owner's rights and duties upon termination are subject to the prior rights and duties of the surety, if any, obligated under any bond provided in accordance with the Contract Documents.
- D. When Owner terminates the Work in accordance with this section, Contractor shall take the actions set forth in paragraph 9.02B, and shall not be entitled to receive further payment until the Work is accepted.
- E. If the unpaid balance of the Contract Sum exceeds the cost of finishing the Work, including compensation for A/E's services and expenses made necessary thereby and any other extra costs or damages incurred by Owner in completing the Work, or as a result of Contractor's actions, such excess shall be paid to Contractor. If such costs exceed the unpaid balance, Contractor shall pay the difference to Owner. These obligations for payment shall survive termination.
- F. Termination of the Work in accordance with this section shall not relieve Contractor or its surety of any responsibilities for Work performed.

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- G. If Owner terminates Contractor for cause, and it is later determined that none of the circumstances set forth in paragraph 9.01A exist, then such termination shall be deemed a termination for convenience pursuant to section 9.02.

9.02 TERMINATION BY OWNER FOR CONVENIENCE

- A. Owner may, upon written notice, terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for the convenience of Owner.
- B. Unless Owner directs otherwise, after receipt of a written notice of termination for either cause or convenience, Contractor shall promptly:
1. Stop performing Work on the date and as specified in the notice of termination;
 2. Place no further orders or subcontracts for materials, equipment, services or facilities, except as may be necessary for completion of such portion of the Work as is not terminated;
 3. Cancel all orders and subcontracts, upon terms acceptable to Owner, to the extent that they relate to the performance of Work terminated;
 4. Assign to Owner all of the right, title, and interest of Contractor in all orders and subcontracts;
 5. Take such action as may be necessary or as directed by Owner to preserve and protect the Work, Project site, and any other property related to this Project in the possession of Contractor in which Owner has an interest; and
 6. Continue performance only to the extent not terminated.
- C. If Owner terminates the Work or any portion thereof for convenience, Contractor shall be entitled to make a request for an equitable adjustment for its reasonable direct costs incurred prior to the effective date of the termination, plus a reasonable allowance for overhead and profit on Work performed prior to termination, plus the reasonable administrative costs of the termination, but shall not be entitled to any other costs or damages, whatsoever, provided however, the total sum payable upon termination shall not exceed the Contract Sum reduced by prior payments. Contractor shall be required to make its request in accordance with the provisions of Section 7.
- D. If Owner terminates the Work or any portion thereof for convenience, the Contract Time shall be adjusted as determined by Owner.

PART 10 - MISCELLANEOUS PROVISIONS

10.01 GOVERNING LAW

The Contract Documents and the rights of the parties herein shall be governed by the laws of the state of Washington. Venue shall be Whatcom County Superior Court.

10.02 SUCCESSORS AND ASSIGNS

Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. Neither party shall assign the Work without written consent of the other, except that Contractor may assign the Work for security purposes, to a bank or lending institution authorized to do business in the state of Washington. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations set forth in the Contract Documents.

10.03 MEANING OF WORDS

Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Reference to standard

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specifications, manuals, or codes of any technical society, organization, or association, or to the code of any governmental authority, whether such reference be specific or by implication, shall be to the latest standard specification, manual, or code in effect on the date for submission of bids, except as may be otherwise specifically stated. Wherever in these Drawings and Specifications an article, device, or piece of equipment is referred to in the singular manner, such reference shall apply to as many such articles as are shown on the drawings, or required to complete the installation.

10.04 RIGHTS AND REMEDIES

No action or failure to act by Owner or A/E shall constitute a waiver of a right or duty afforded them under the Contract Documents, nor shall such action or failure to act constitute approval of an acquiescence in a breach therein, except as may be specifically agreed in writing.

10.05 CONTRACTOR REGISTRATION

Pursuant to RCW 39.06, Contractor shall be registered or licensed as required by the laws of the State of Washington, including but not limited to RCW 18.27.

10.06 TIME COMPUTATIONS

When computing any period of time, the day of the event from which the period of time begins shall not be counted.

10.07 RECORDS RETENTION

The wage, payroll, and cost records of Contractor, and its Subcontractors, and all records subject to audit in accordance with section 8.03, shall be retained for a period of not less than 6 years after the date of Final Acceptance.

10.08 THIRD-PARTY AGREEMENTS

The Contract Documents shall not be construed to create a contractual relationship of any kind between: A/E and Contractor; Owner and any Subcontractor; or any persons other than Owner and Contractor.

10.09 ANTITRUST ASSIGNMENT

Owner and Contractor recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the purchaser. Therefore, Contractor hereby assigns to Owner any and all claims for such overcharges as to goods, materials, and equipment purchased in connection with the Work performed in accordance with the Contract Documents, except as to overcharges which result from antitrust violations commencing after the Contract Sum is established and which are not passed on to Owner under a Change Order. Contractor shall put a similar clause in its Subcontracts, and require a similar clause in its sub-Subcontracts, such that all claims for such overcharges on the Work are passed to Owner by Contractor.

10.10 PREVAILING PARTY

If mediation between the parties is unsuccessful, and the parties become involved in arbitration arising out of this Contract or the performance thereof, the arbitrator shall award reasonable attorneys' fees, costs and expert witness fees to the substantially prevailing party. In determining which party is the substantially prevailing party and the reasonableness of the fees, the arbitrator shall take all of the circumstances into account, including but not limited to the following factors: 1) the percentage of the recovery against the amount of the claim; 2) the successful defense against a large proportion of a claim; and 3) written offers of judgment. The attorneys' fees and costs as provided herein shall be recoverable from the arbitration, Superior Court action, any appeals therefrom and collections.

SECTION 00800 SUPPLEMENTAL CONDITIONS

FEDERAL FUNDING AGENCY REQUIRED SUPPLEMENTAL CONTRACT PROVISIONS (HAZARD MITIGATION GRANT AGREEMENT, GENERAL TERMS AND CONDITIONS, SECTION A.11.a)

1. Regarding administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms: No supplemental conditions. Refer to the General Conditions.
2. Regarding termination for cause and for convenience by the Owner: No supplemental conditions. Refer to the General Conditions.
3. Equal Employment Opportunity Clause:

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
3. The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
5. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

6. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
7. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
8. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

4a. Davis-Bacon Act, as amended (40 U.S.C. 3141-3148).

Refer also to other parts of the Contract Documents including, but not limited to 00200 Instructions to Bidders, 004100 Bid Proposal, General Conditions, and Appendix B.

Contractors must comply with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. All suspected or reported violations will be reported to the Federal awarding agency.

4b. Copeland "Anit-Kickback" Act (40 U.S.C. 3145) as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"):

Contractors must comply with the regulations of the Copeland "Anit-Kickback" Act (40 U.S.C. 3145) as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. All suspected or reported violations will be reported to the Federal awarding agency.

5. Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708).

Contractors must comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contractors for transportation or transmission of intelligence.

6. Regarding Rights to Inventions Made Under a Contract or Agreement: No supplemental conditions. Not applicable.

7. Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended.

Contractors must comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended. Violations will be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

8. Debarment and Suspension (Executive Orders 12549 and 12689).

Contract award will not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

9. Byrd Anti-Lobbying Amendment (31 U.S.C. 1352).

Contractors applying or bidding for an award exceeding \$100,000 must file the required certification (see Section 00410 Bid Proposal and attached forms). Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

10. Procurement of recovered materials.

Contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level

of completion, where the purchase price of the item exceeds \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

11. Notice is hereby given that all Contractors must comply with all Federal awarding agency requirements and regulations pertaining to reporting.

12. Notice is hereby given that all Contractors must comply with all Federal awarding agency requirements and regulations pertaining to copyrights and rights in data.

13. Contractor shall provide access to the Washington State Military Department, the District, the Federal awarding agency, the Comptroller General of the United States, or any of their duly authorized representatives to any books, documents, papers, and records of the contractor which are directly pertinent to that specific contract for the purposes of making audit, examination, excerpts, and transcriptions.

14. Contractor shall retain all required records for six years after the District has made final payments and all other pending matters are closed.

15. Contractor shall comply with all mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871).

OTHER SUPPLEMENTAL CONDITIONS

16. Bidders List (40 CFR Part 33 part 33.501)

All bidders shall submit the following information for all firms that bid or quote on subcontracts (including DBE and non-DBE firms) with their bid proposal.

1. Entity's name with point of contact;
2. Entity's mailing address, telephone number, and e-mail address;
3. The procurement on which the entity bid or quoted, and when; and
4. Entity's status as an MBE/WBE or non-MBE/WBE.

***** END OF SECTION *****

PART 3

TECHNICAL SPECIFICATIONS

SECTION 01 02 50 – SCOPES OF BID / MEASUREMENT AND PAYMENT

This section outlines the individual bid items listed on the Bid Schedule in Section 00410 - Bid Proposal. The descriptions are not all-inclusive, but generally indicate where costs should be allocated within the bid proposal. Descriptions represent work that shall be complete, in-place, tested, and in full operation prior to Owner's acceptance.

Each item is to be paid on a lump sum or unit price basis and shall include furnishing all necessary planning, labor, equipment, materials, and supplies required to furnish, install and test the improvements covered under the item. Each item shall include, as applicable, work shown on the plans including all excavations, backfill, backfill materials, compaction, pavement removal, disposal of waste material at contractor's site, locating and protecting existing utilities and services, base and top course, paving, trenching, imported backfill, pipe bedding, cleaning, testing, surface restoration and landscaping. The scope of each bid item is outlined below. It is not intended to include all of the appurtenances of an item in the description. See appropriate Specification in the Special Provisions section or WSDOT Standard Specifications and as shown on the Drawings for a more complete representation of the work. It is the responsibility of the Bidders to include all costs for the completed project in the bid items listed.

BID SCHEDULE – BASE BID

- 1. Mobilization / Demobilization** – Includes mobilization, demobilization, pre-construction expenses and the costs of preparatory work and operations performed by the Contractor. Work includes, but is not limited to: mobilization of labor and equipment, necessary permits, temporary construction fencing, demobilization of labor and equipment, and site cleanup prior to final acceptance. Refer to WSDOT Section 1-09.7 for costs that may not be included. This bid amount may not be more than 10-percent of the base bid, with partial payments as follows:
 - i. 20% paid at project onset
 - ii. 20% paid upon approval of all submittals
 - iii. 40% paid after construction starts
 - iv. 20% paid with the final payment.
- 2. Trench Safety Excavation Provisions** - For all trenches exceeding a depth of four feet, all costs for adequate trench safety systems shall be identified as a separate bid item in compliance with Chapter 39.04 RCW. The purpose of this provision is to ensure that the bidder agrees to comply with all relevant trench safety requirements of Chapter 49.17 RCW. This bid amount shall be considered part of the total base bid. Include a lump sum dollar amount (even if the value is \$0.00) to be considered responsive to the bid solicitation. Measurement and payment will be lump sum, with partial payments based on approximate percentage of completion of project.
- 3. Temporary Traffic Control** – Includes all labor, material, and equipment associated with providing pedestrian and vehicular traffic control in the project work zones. Work shall include, but not be limited to, traffic control plan(s), signage, flagging, barriers, and notification of affected entities (Whatcom Transit, Schools, Fire District, et al), and as directed by the Owner, Whatcom County, or Sudden Valley Community Association. Measurement and payment will be lump sum, with partial payments based on approximate percentage of completion of project.

4. **Temporary Erosion and Sediment Control** – Includes all costs associated with procurement, installation, maintenance throughout the duration of the project, and removal of temporary erosion and sediment control measures, including but not limited to Orange Barrier Fencing, Filter Fabric/Silt Fence, and Geotextile Encased Check Dam, as called for in the Plans and Specifications and in accordance with state and local regulations. Measurement and payment is lump sum, with partial payments based on approximate percentage of completion of project.
5. **Clearing and Grubbing** – This work includes all labor, materials, and equipment required to remove and dispose of vegetation, trees, stumps, sod, and roots within the project limits per Section 2.01 of the WSDOT Standard Specifications. No tree or tree limbs shall be removed, except as required for the work, as noted on the Plans, or as authorized by the Owner and Engineer. Note that native topsoil/forest duff layer, anticipated up to approximately 1-ft thick, shall be salvaged and stockpiled on site, and is covered under a separate bid item. Wood chipping of brush to be stockpiled and used on site as mulch is covered under a separate bid item. Debris shall be hauled to a waste site obtained and provided by the Contractor. Measurement and payment is lump sum.
6. **Brush and Log Management** – This work includes all labor, materials, and equipment required to chip and stockpile branches and brush suitable for later use on site as wood chip mulch for restoration of reforested areas. Existing felled trees shall be cleared of all branches, cut to standard log truck hauling length (25-ft as noted in Plans and Specifications, or as directed by the property owner), and delivered and stacked at the property owner's direction to a site near the construction entrance. All other related vegetation and clearing related debris shall be hauled to a waste site obtained and provided by the Contractor. Measurement and payment is lump sum.
7. **Native Topsoil Salvage, including Stockpiling** – Includes all labor, materials, and equipment required to salvage and stockpile on site all topsoil/forest duff layer material, anticipated up to approximately 1-ft thick, generated from onsite clearing and grubbing and excavation work. Stockpiling of material shall be in accordance with the Plans and Specifications and all Whatcom County permitting requirements. Measurement and payment is lump sum.
8. **Site Earthwork** – Includes all labor, materials, and equipment required for all site earthwork in accordance with the Plans and Specifications and all Whatcom County permitting requirements. Site Earthwork shall include, but not be limited to, excavation including stockpiling, excavation including haul, concrete water reservoir foundation preparation including crushed surfacing base course (CSBC) subgrade and coordination with site piping work, and all other related work. Any hauling of material shall be to a location obtained and provided by the Contractor in accordance with all state and county regulations. The Contractor shall provide documentation for the disposal site(s). Rock excavation requiring special equipment is covered under a separate bid item. Price shall include all costs associated with submittals, required utility locates, initial potholing, excavation, dewatering, determining and providing suitable access for work, protection of existing utilities, and protection of trees and other site features intended to remain. Clearing and grubbing, shoring and erosion control are covered under other bid items. Measurement and payment is lump sum.
9. **Concrete Water Reservoirs, Foundations, and All Appurtenances** – Includes all labor, materials, and equipment associated with the construction of two concrete potable water storage tanks and complete installation of all appurtenances within and part of the concrete storage tanks. Includes foundations and complete reservoir construction including disinfection and testing, vents, hatches, level indicators, ladders, instrumentation ports, sample stations, inlet, outlet and overflow piping typically provided by the reservoir supplier, etc. Electrical work is covered under separate bid items. Includes all piping, fittings, joints, adapters, supports, foundation penetrations, coordination with all foundation preparation work, coordination with all piping and appurtenances within, under, and near the foundation, and other related work. Price shall include all costs associated with submittals, required utility locates, initial potholing of location, dewatering, determining and providing suitable access for

work, and protection of existing utilities. Clearing and grubbing, site work excavation, shoring, erosion control, and surface restoration are covered under separate bid items. Measurement and payment is lump sum.

10. Site Piping – Includes all labor, material, and equipment associated with the installation of all site piping and systems as shown on the Plans and Specifications including, but not limited to:

- Water, Overflow/Drain, and Sewer Utilities: 8-in and 12-in DI water piping, 8-in and 12-in water gate valves (buried), 8-in and 12-in flexible expansion joints, 4-in PVC vault drain to daylight piping, combination air release/air vacuum valve assembly, 2-in blowoff assembly, hot-tap connection to existing 10-in cast iron water piping, insertion valve and related work, 8-in PVC overflow/drain piping, 8-in DI overflow/drain piping (at air gap structure), 8-in drain line gate valves, overflow/drain air gap structure, sanitary sewer saddle manhole, 8-in PVC sanitary sewer piping,
- Stormwater Utilities: Catch Basin Type 1, Catch Basin Type 2 48", 6-in and 8-in PVC storm drain piping, and level spreader dispersion trench.

This item includes all site piping and related work required for a complete installation. Work includes site piping beginning at the first pipe joint outside the limits of any water utility vaults. Other piping is included in valve and meter vault bid items, and any piping in or attached to the reservoir typically provided by the reservoir supplier, and all work between this and other bid items shall be coordinated. Work shall include, but not be limited to, all piping, fittings, joints, adapters, tracer wire and appurtenances including pedestals, excavation, bedding, compacted import backfill, detector tape, disinfection, and testing. The unit price for this item shall include all costs associated with submittals, required utility locates, initial potholing of connection locations and utility crossings, clearing and grubbing, excavation, dewatering, determining and providing suitable access for work, and protection of existing utilities. This item includes surface restoration and the removal, hauling and disposal, and replacement in-kind of all surface restoration required for the work including unpaved/non-traffic areas, permeable ballast gravel access surfacing (existing access through site), and asphalt concrete paved surfacing. Tank site pad and apron surface restoration is covered under a separate bid item. Shoring, traffic control, and erosion control are covered under separate bid items. Measurement and payment is lump sum.

11. Outlet Valve Vault, Standard - Includes all labor, material, and equipment associated with the installation of the Outlet Valve Vault, pipe and appurtenances, in accordance with the plans and specifications. Work shall include, but not be limited to, all excavation, crushed base course, backfill for foundations, vault (base, center, or bottom, top, and hatch), joint sealing, exterior coating, piping and fittings within vault, joints, adapters, pipe supports, drain pipe screen and connections, reinforced concrete lid, penetration boots, a 12-in gate valve, 12-in check valve, 12-in dismantling joint, emergency tanker truck filling and sample tap assembly, access ladders with safety posts and access hatches. The unit price for this item shall include all costs associated with submittals, required utility locates, initial potholing of location, clearing and grubbing, excavation, dewatering, backfill material and compaction, determining and providing suitable access for work, protection of existing utilities. Shoring, surface restoration, and erosion control are covered under separate bid items. Measurement and payment is lump sum.

12. Outlet Valve Vault w/ Seismic Valve and Actuator - Includes all labor, material, and equipment associated with the installation of Outlet Valve Vault, pipe and appurtenances, in accordance with the plans and specifications. Work shall include, but not be limited to, all excavation, crushed base course, backfill for foundations, vault (base, center, or bottom, top, and hatch), joint sealing, exterior coating, piping and fittings within vault, joints, adapters, pipe supports, drain pipe screen and connections, reinforced concrete lid, penetration boots, a 12-in butterfly valve with motorized valve actuator provided as a unit by the same supplier, 12-in spacer spool, 12-in check valve, 12-in dismantling joint,

emergency tanker truck filling and sample tap assembly, access ladders with safety posts and access hatches. The unit price for this item shall include all costs associated with submittals, required utility locates, initial potholing of location, clearing and grubbing, excavation, dewatering, backfill material and compaction, determining and providing suitable access for work, protection of existing utilities. Shoring, surface restoration, and erosion control are covered under separate bid items. Measurement and payment is lump sum.

13. Flow Meter Vault - Includes all labor, material, and equipment associated with the installation of Flow Meter Vault, pipe and appurtenances, in accordance with the plans and specifications. Work shall include, but not be limited to, all excavation, crushed base course, backfill for foundations, vault (base, center, or bottom, top, and hatch), joint sealing, exterior coating, piping and fittings within vault, joints, adapters, pipe supports, drain pipe screen and connections, reinforced concrete lid, penetration boots, a 12-in electromagnetic flow meter (furnishing, programming, start-up, commissioning, training, etc. of the mag meter is covered under separate bid items), 12-in dismantling joint, access ladders with safety posts and access hatches. The unit price for this item shall include all costs associated with submittals, required utility locates, initial potholing of location, clearing and grubbing, excavation, dewatering, backfill material and compaction, determining and providing suitable access for work, protection of existing utilities. Surface restoration is incidental to this item. Shoring and erosion control are covered under separate bid items. Measurement and payment is lump sum.

14. Electrical, Telemetry & Instrumentation – Includes all labor, material, and equipment associated with the site electrical, telemetry, and instrumentation components of the Project in accordance with the Plans and Specifications. Work shall include, but not limited to:

- All PSE coordination and scheduling for power service, power service conduit, cables, trenching and backfilling, electrical enclosure, enclosure concrete pad, meter base, power panel, installation of control panel inside electrical enclosure, power and control system to motorized valve, site lighting on tanks, electrical contractor mobilization and demobilization and other general conditions and preparatory work. Owner will pay design and construction costs associated with the needed electrical elements installed by Puget Sound Energy or its contractor(s). Owner will pay PSE utility service charges.
- Constructing and furnishing the completed control panel including all required components and sub-assemblies.
- Furnishing, installation, and field termination of instrumentation including 12-in electromagnetic flow meter, radar level transducers, high level alarm float switches, tank hatch intrusion switches, tank exterior ladder cage gate intrusion switches, and vault intrusion switches.
- Electrical Enclosure, Control Panel, control devices, integration with reservoir systems. Process Control and Instrumentation Systems (PCIS), Control Panel, telemetry hardware, temporary connections, including modification of existing. See also Electrical Specifications section 26 00 10 and 28 90 00 for work included.

Includes field start-up, commissioning, and training as required for all equipment and services. Includes Operation and Maintenance manuals for all equipment. Work shall include everything required for a complete installation. Measurement and payment is lump sum.

15. Steel Reservoir Demolition – Includes all labor, material, and equipment associated with:

- The demolition of the existing steel reservoir and foundation.
- The demolition of existing utilities associated with the existing steel reservoir to be demolished including electrical, telecommunications, and controls, drain/sewer piping, water piping and vaults, and any other utilities as required.

Work shall include, but not be limited to, demolishing, excavation, breaking up concrete foundation as shown on the Plans, pipe cutting and plugging, backfilling, surface restoration not within the limits of surface restoration covered by other bid items, and removing and disposal of all other demolition debris from the site. **Note the reservoir primer/paint contains lead as identified in the Specifications.** The concrete base has also been tested for asbestos and results indicate no asbestos, see Specifications. This work shall include all work associated with addressing construction methods, mitigation, control of dust and materials, final cleanup, and proper removal, hauling, and disposal of lead contaminated materials in accordance with all required regulations. The price for this item shall include all costs associated with submittals, required utility locates, initial potholing of location, clearing and grubbing, excavation, dewatering, determining and providing suitable access for work, protection of existing utilities. Traffic control, shoring, and erosion control are covered under separate bid items. Note the District will obtain and pay for the Whatcom County Demolition Permit only. The Contractor is responsible for complying with all requirements of the Demolition Permit. Measurement and payment is lump sum.

16. Site and Surface Restoration – Includes all labor, material, and equipment associated with the following work as shown on the Plans and Specifications:

- Tank site gravel backfill around tank foundation and Gravel Access pad – furnishing, placing, grading, and compacting Crushed Surfacing Base Course (CSBC), or native sandstone excavated from the project site and crushed/processed to meet the specification and as described in the Geotechnical Report. Crushing/processing, including all testing to ensure conformance with the specifications, of native sandstone excavated from the site, if Contractor elects to do so, is incidental to this bid item. Gravel surfacing material shall compact readily. Any gravel surfacing that ruts after the initial compaction effort is not acceptable. Any water necessary to meet compaction requirements shall be incidental to this bid item. Maintenance of the gravel backfill shall be Contractor's responsibility up to the time of final surfacing. When used on the access edge in the area of the fill slope, the width of the access road shall be overbuilt and cut back with an excavator to the desired extents to provide for optimum compaction. Maintenance of the final gravel surface shall be Contractor's responsibility up to the time of project closeout.
- Existing steel reservoir demolition site fill placement - Furnishing, placing, grading, and compacting of fill material excavated from the project site and stockpiled as required in accordance with the Plans and Specifications, including any maintenance or temporary protection/erosion control of the backfill up to the time of final topsoil, mulch, and plantings are placed and installed.
- Bollards - final locations shall be approved by the Owner.
- Gravity block wall – including blocks, aggregates, drain pipe complete to CB, geotextile fabric, etc. for a complete installation.
- Chain link fence – WSDOT Type 3, 6-ft tall chain link fence plus 3-strand barbed wire.
- 20-ft double chain link gate – per WSDOT Standard Detail L-30.10-02, 6-ft tall plus 3-strand barbed wire.
- Cement concrete apron – with rough broom finish.

Work shall include, but not be limited to, submittals, all required materials, required utility locates, initial potholing of location, clearing and grubbing, excavation, dewatering, determining and providing suitable access for work, protection of existing utilities, any water, dewatering or other moisture content adjustment methods necessary to meet compaction requirements, and surface restoration. Shoring and erosion control are covered under separate bid items. Measurement and payment is lump sum.

- 17. Project Mitigation Site Preparation and Planting** – Includes all labor, material, and equipment associated with furnishing, placing, grading, planting, maintaining, and guaranteeing all topsoil, mulch, and plantings as required in accordance with the Plans and Specifications. This work applies to the entire project including new tank site and site of the existing steel reservoir to be demolished. Any water necessary for plant establishment or survival shall be incidental to this bid item, see Section 32 93 00 for other information. Maintenance of the restored surfacing and plantings shall be the Contractor's responsibility through the guarantee period. Work shall include, but not be limited to, submittals, all required materials, required utility locates, initial potholing of location, clearing and grubbing, excavation, dewatering, determining and providing suitable access for work, protection of existing utilities, and surface restoration. Shoring and erosion control are covered under separate bid items. Measurement and payment shall be lump sum.
- 18. Miscellaneous Owner Directed Work** – At the discretion of the Owner, this procedure for Owner Directed Work may be used in lieu of the more formal procedure as outlined in General Conditions Section 7. The Contractor will be provided a copy of the completed order for Owner Directed Work. The agreement for the Owner Directed Work will be documented by signature of the Contractor or notation of the verbal agreement. If the Contractor is in disagreement with anything required by the order for Owner Directed Work, the Contractor may protest the order as provided in General Conditions Section 7. Measurement will be negotiated prior to commencing any such work under this pay item and shall be for work to remedy unforeseen conditions, utility conflicts, minor landscaping, minor drainage improvements, or special surface restoration. Payments or credits will be determined in accordance with General Conditions Section 7. For the purposes of providing a common Proposal for all Bidders, the Owner has entered an amount for Miscellaneous Owner Directed Work in the Proposal to become part of the total Bid by the Contractor.
- 19. Construction Records** – Includes all costs associated with performing all closeout activities including but not limited to O&M Manuals, start-up & testing reports, final submittals and releases, warranty documentation, and contractor as-built drawings. Measurement and payment shall be lump sum.
- 20. Build America, Buy America Act (BABAA) Compliance** – This project may be funded in part with FY2024 Community Project Funding (congressional earmark), which may require compliance with BABAA. This item includes all labor, materials, and equipment required for complying with BABAA requirements including providing all required certifications, submittals and paperwork for all materials used in the project required to be in conformance with BABAA requirements. Measurement and payment shall be lump sum.

Contractor shall not bill for work under this bid item unless directed to by the Owner in writing. Payment will not be made for this bid item if the compliance requirement is not mandated for this project by the Owner's funding source(s).

The unit price bid items for Bid Items 21 through 23 shall be used as needed for equitable adjustment to the project scope and shall cover the complete cost of all labor, materials and equipment necessary to perform the work that is beyond the limits and scope shown on the project plans. Written authorization is required from Owner prior to incurring costs against these bid items.

- 21. Unscheduled Rock Excavation requiring Special Equipment, including Stockpiling and/or Haul** – Includes all labor, materials, and equipment required to salvage and stockpile if the Contractor elects to do so, or immediately haul off-site and dispose of, excavated rock material that requires rock/ripper teeth or a rock breaker. Contractor shall notify Owner immediately upon encountering such rock so that it can be measured and tracked accordingly. If the Contractor chooses to do so, stockpiling of material shall be in accordance with the Plans and Specifications and all Whatcom County permitting requirements. Hauling of material shall be to a location obtained and provided by the Contractor in accordance with all state and county regulations. The Contractor shall provide documentation for disposal site. Measurement and payment is per cubic yard of in-place material for the minimum required

removal for constructing the improvements per Plan. All quantities will be measured and recorded in the Engineer's Daily Report and the Contractor shall be responsible for reconciling recorded quantities with the Engineer on a daily basis.

Contractor shall not bill for work under this bid item unless directed to by the Owner in writing. This bid item is not subject to a percentage price adjustment for a change in quantity, either over or under the bid quantity. Payment may not be made for this bid item or may be more or less than the bid quantity at project closeout.

- 22. Unscheduled Unsuitable Foundation Over-Excavation** – Includes all costs for labor, materials, and equipment required to excavate, dewater, and haul unsuitable native subgrade materials. The Contractor is advised that the excavation of any and all unsuitable material must be authorized by the Engineer in writing prior to the commencement of said excavation by the Contractor. Measurement and payment will be by the cubic yard, in-place and shall be to the limits as designated by the Engineer. There shall be no payment if the Engineer believes removal of materials is needed because of damage caused by the Contractor's operations. All quantities will be measured and recorded in the Engineer's Daily Report and the Contractor shall be responsible for reconciling recorded quantities with the Engineer on a daily basis.

Contractor shall not bill for work under this bid item unless directed to by the Owner in writing. This bid item is not subject to a percentage price adjustment for a change in quantity, either over or under the bid quantity. Payment may not be made for this bid item or may be more or less than the bid quantity at project closeout.

- 23. Unscheduled Additional Crushed Surfacing Base Course (CSBC)** – Includes all costs for labor, materials, and equipment required for furnishing, installing, compacting, and testing CSBC as required for areas of unsuitable foundation over-excavation as designated by the Engineer. Measurement and payment shall be measured per ton, in-place, based on truck tickets and shall be to the limit designated and approved by the Engineer.

Contractor shall not bill for work under this bid item unless directed to by the Owner in writing. This bid item is not subject to a percentage price adjustment for a change in quantity, either over or under the bid quantity. Payment may not be made for this bid item or may be more or less than the bid quantity at project closeout.

***** END OF SECTION *****

SECTION 01 10 00 - SUMMARY OF WORK

PART 1. GENERAL

1.01 DESCRIPTION OF WORK

- A. The Lake Whatcom Water & Sewer District Division 7 Replacement Project involves the replacement of a 1.0 MG steel water reservoir with two 238,000-gallon (nominal) concrete water reservoirs.
- B. The project is located in the Lake Whatcom Watershed and land disturbance is limited to less than 500 square feet from October 1 to May 31. The majority of earthwork must occur from June 1 to September 30.
- C. The Whatcom County Building Permit has been approved and paid for by the District, and will be issued as soon as a licensed contractor of record is selected for the project. The Building Permit will be eligible for issuance on June 1, 2024 (due to the seasonal watershed closure). The Contractor shall be required to comply with all requirements of the Building Permit and coordinate all County inspections related to the Building Permit. A copy of the draft Building Permit is included in the Appendix.
- D. The project is funded in part by the Federal Emergency Management Agency (FEMA) and Washington State Emergency Management Division (WA-EMD) through the Hazard Mitigation Assistance Program and subject to their regulatory requirements. FEMA Subgrant Number 4309-18.
- E. This project may also be funded in part by a Community Project Funding grant (Congressional earmark) and if so, may need to meet Build America, Buy America Act (BABAA) requirements. Note additive Bid Item regarding complying with BABAA for the entire project.
- F. The project includes but is not limited to:
 - 1. Construction of two 238,000-gallon (nominal) water reservoirs with piping and appurtenances, of approximate dimensions 32-ft diameter by 46-ft height;
 - 2. Temporary erosion and sediment control around work areas;
 - 3. Construction staking;
 - 4. Clearing, grubbing, and management of previously felled trees including brush and log handling with tree salvage to Owner;
 - 5. Installation of new 12-inch and 8-in water main and appurtenances, including a valve insertion and hot tap to existing main;
 - 6. Installation of seismic valve consisting of butterfly valve and electric motor actuator;
 - 7. Installation of new concrete vaults, valves, fittings, drains, and appurtenances;
 - 8. Installation of new 8-inch overflow/drain lines and appurtenances;
 - 9. Installation of new 6-inch and 8-inch storm drain piping, structures, and appurtenances;
 - 10. Installation of new 8-inch sanitary sewer piping, structures, and appurtenances;
 - 11. Installation of combination air release/vacuum valve assemblies, sample taps, and other appurtenances;
 - 12. Installation of new gravity block wall, site fencing;

13. Installation of new electrical, controls, and instrumentation;
 14. Connections to existing 10-inch water mains;
 15. Connections to existing 8-inch sanitary sewer;
 16. Demolition of existing IMG steel water tank that has lead paint/primer;
 17. Site Restoration and grading including replacement of asphalt, concrete, gravel, and landscaping.
 18. Note: All devices requiring locks, including but not limited to doors, gates, access hatches, convenience hatches, electrical control panels, telemetry panels, etc., shall be fitted to match Owner's standard locks and keys. The Owner shall provide the key requirements to the Contractor.
- G. Summary: The foregoing outline of the primary elements of construction within the project is intended as a summary of that work only. The work outlined is not to be regarded by the Contractor as an exhaustive definition of the scope of work.

1.02 TIME FOR COMPLETION

- A. The Contractor shall have achieved substantial completion by **August 1, 2025** and complete all requirements of the contract (Final Completion) by **September 30, 2025**.
- B. The days against the contract time may be paused, at the discretion of the Owner and Engineer, should materials availability be outside the control of the contractor and their suppliers.

1.03 WORK AND RESPONSIBILITIES

- A. Unless otherwise indicated, Contractor's responsibilities include, but are not limited to the following:
 1. Providing and paying for labor, materials, equipment, tools, machines, facilities, and services necessary for proper execution and completion of work.
 2. Paying required taxes.
 3. Giving required notices.
 4. Enforcing strict discipline and good order among employees and subcontractors. Employing only persons skilled in the tasks assigned to them.
 5. Using new materials, except as noted.
 6. Maintaining required egress and other requirements in accordance with governing Codes and Ordinances throughout the work.
 7. *Obtaining required right-of-way encroachment permit(s).* The Sudden Valley Community Association (SVCA) right-of-way encroachment permit application will be submitted and paid for by the Contractor for this project. The Owner will directly reimburse the Contractor for the encroachment permit fee. The encroachment permit shall be issued to the Contractor. A draft of the permit is included in the Appendix of the Project Manual. The Contractor will be responsible for submitting all of the required information for the permit application. The Contractor is required to coordinate with the SVCA inspector and provide notice as required by the permit.

1.04 SEQUENCE/PHASING

- A. Contractor may use any sequence of operations compatible with Owner-approved Progress Schedule, but service interruptions to existing customers shall be minimized and are limited to six hours maximum duration *unless otherwise authorized in writing by the OWNER*.
- B. Contractor shall prepare and submit a **Sequence and Phasing Plan** to the Engineer for approval. This Plan shall supplement the Project Schedule provide additional details on the Contractor's approach to installation of the new reservoirs and piping while maintaining the operation of the existing water reservoir and piping until the new facilities are fully operational and have successfully completed testing and startup.
- C. Contractor shall complete all submittals before mobilizing for work.
- D. Chlorinated water shall be dechlorinated prior to discharge to any storm drain, ditch or surface water. There is public sewer nearby; it's potential use shall be coordinated with LWWSD.
- E. Water main tie-ins shall not be scheduled to be performed on Fridays.
- F. These documents are not to be interpreted implicitly or explicitly as definition of procedure and sequence of operations. Order as to procedure and sequence of operations are Contractor options, consistent with contract documents and as approved by the Engineer.

1.05 HOURS OF WORK

- A. Refer to 00700 General Conditions Section 5.05.

1.06 COOPERATION AND COORDINATION

- A. Contractor is responsible for coordinating and scheduling work of subcontractors to expedite progress of the Project.
- B. Subcontractor Instructions: Subcontractors to become familiar with Conditions of the Contract, Division 1, General Requirements, and the work of other Sections related to their own work.

1.07 CONTRACTOR'S USE OF PREMISES

- A. Contractor shall assume full responsibility for the protection and safekeeping of materials for this Contract stored on the site. Contractor shall move any stored products under Contractor's control at no cost to the Owner, if said stored materials interfere with operations of the Owner or separate contractor.
- B. If necessary, obtain and pay for the use of additional private storage or work areas needed for operations. Provide written evidence of agreement between the private property owner and the Contractor.
- C. The Contractor shall not make any claim against the Owner for the actions of a trespasser at the project site that results in damages to material or equipment.

1.08 PROTECTION OF PUBLIC FROM CONSTRUCTION SITES AND ACTIVITIES

- A. During construction, the Contractor shall at all times maintain satisfactory and substantial temporary fencing, railing, barricades or steel plates at all openings, obstructions or other hazards and comply with requirements of the Sudden Valley Community Association

Encroachment Permit or private property Owner's requirements. All such barriers shall have warning signs or lights as necessary for safety. The Contractor shall be responsible for providing any safety and security measures necessary to protect residents and the general public through the duration of the project.

- B. Protection and safety measures may be inspected daily by the Owner's Representative. Inadequate measures shall be corrected within 2 hours.

PART 2. MATERIALS (NOT USED)

PART 3. EXECUTION (NOT USED)

*****END OF SECTION*****

SECTION 01 11 00 – SPECIAL PROJECT PROCEDURES

PART 1. GENERAL

1.01 WORK INCLUDED

- A. Work specified in this section includes special procedures for providing a safety and health plan.

1.02 SUBMITTALS

- A. The following submittals shall be provided in accordance with Section 01 33 00:
 - 1. Safety and Health Plan

1.03 SAFETY AND HEALTH REGULATION

- A. The Contractor shall comply with safety and health regulations for construction in accordance with Section 01 41 00, Regulatory Requirement and the General Conditions.

1.04 SAFETY AND HEALTH PLAN

- A. The Contractor shall develop and maintain for the duration of the Contract a Safety and Health Plan that will effectively incorporate and implement all required health and safety precautions. The Safety and Health Plan shall be submitted by the Contractor prior to beginning work on-site.
- B. The Contractor shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the Safety and Health Plan. The Contractor is responsible to ensure that all necessary monitoring equipment, protective clothing, and other supplies and equipment are available to implement the plan.
- C. In the event the Safety and Health Plan proves to be inadequate to protect the employees and the public, as determined by the Construction Manager or any regulatory agency or jurisdiction, then the plan shall be modified to meet the requirements of those regulatory agencies and the Owner.
- D. The Safety and Health Plan shall be structured so that it complies with project Conditions and WSDOT General Requirements and, as a minimum, include the following considerations:
 - 1. Objective
 - 2. Employee Safety Program
 - 3. Personal protection
 - 4. Hazard evaluation of different work activities
 - 5. Work practices
 - 6. Cleanup
 - 7. Spill cleanup
 - 8. Work limitations
 - 9. Authorized personnel

10. Emergency procedures
11. Person responsible for safety and health enforcement
12. Telephone numbers
13. 24-hour number to contact Contractor
14. Emergency services
15. Other items as pertinent

*****END OF SECTION*****

SECTION 01 31 00 - PROJECT COORDINATION

PART 1. GENERAL

1.01 PRE-CONSTRUCTION MEETING

- A. A pre-construction conference shall be held at a time and place fixed by the Engineer and Owner within two weeks from the date of Notice to Proceed, or as determined by the Engineer and Owner. The Contractor's project manager, field superintendent, and major subcontractors' superintendents must attend. The property owner, Whatcom County, and Sudden Valley Community Association representatives are also expected to attend.
- B. The Contractor should be prepared for discussion of the following:
 - 1. Responsibilities of all involved parties
 - 2. Contractor's schedule
 - 3. Subcontracts
 - 4. Change order procedures
 - 5. Project inspection
 - 6. Acceptance of work
 - 7. Labor standards requirements
 - 8. Handling of disputes
 - 9. Additional issues as required.

1.02 PROGRESS MEETINGS

- A. Meetings will be held weekly as required to review the progress of the work, including any issues that may impact project schedule, make field observations and address any conflicts or problems.
- B. Meeting attendees shall be qualified and authorized to act on behalf of the firm or agency they represent.
- C. The Engineer shall preside over progress meetings and shall be responsible for recording and disbursing significant proceedings and decisions.
- D. Contractor shall provide an updated schedule at the weekly meeting. Owner will post schedule updates on their website or through usual means of District happenings.

1.03 UTILITY SERVICE INTERRUPTIONS

- A. Construction schedule shall include all anticipated utility service interruptions (e.g. water, telephone, communication, electrical).
- B. Customer water service interruptions are limited to six hours of interruption, Monday thru Thursday, only between the hours of 8:00 a.m. and 4:00 p.m., and only with a minimum of 48 hours written notice to each customer affected by the service interruption.
- C. Contractor is responsible for coordinating with the Owner with sufficient time ahead of service interruptions. The Owner will distribute written notification to each customer affected by the service interruption.
- D. If any service interruption exceeds the time and limits allowed, the Contractor shall implement their emergency / contingency plan to provide temporary water pipe and fittings

to maintain water supply.

PART 2. MATERIALS (NOT USED)

PART 3. EXECUTION (NOT USED)

***** END OF SECTION *****

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1. GENERAL

1.01 DESCRIPTION

- A. This listing of submittals is a checklist for the Contractor's convenience and is not an exhaustive listing of provisions or the requirements of these Contract Documents.
- B. In addition to construction progress submittals, the Contractor shall furnish technical material submittals and shop drawings as described throughout the technical specifications.

1.02 GENERAL SUBMITTAL REQUIREMENTS

- A. Forward **all** material and equipment submittals and shop drawings to the Engineer, together, at one time. Individual or incomplete submittals are not acceptable and will be rejected and returned without review.
- B. Organize submittals in same sequence as they appear in Specification Sections and Drawings.
- C. Identify and label each submittal item by reference to Specification Section paragraph in which item is specified, or Drawing and Detail number.
- D. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and review materials and equipment. Words "as specified" are not sufficient identification.
- E. It is the responsibility of the Contractor to coordinate the work of the various trades involved with the work under this agreement. Contractor shall check all submittals by his subcontractors and mark them with his approval prior to submittal.
- F. Contractor shall provide submittals evidencing that materials and equipment supplied under the contract meet the project specifications. Contractor shall not order materials or equipment without first receiving approval of the submittals.

1.03 GENERAL SCHEDULE FOR SUBMITTALS

- A. With Notice of Intent to Award
 - 1. Performance & Payment Bonds
 - 2. Liability Insurance
 - 3. Signed Agreement
- B. 14 Days after Agreement (or earlier)
 - 1. Construction Schedule (to be available at Pre-Construction Meeting also)
 - 2. Schedule for providing Shop Drawings and material and equipment submittals
- C. Prior to Commencing Work
 - 1. Final Project Schedule
 - 2. Statement of Intent to Pay Prevailing Wages
- D. Applications for Payment
 - 1. Paid receipts and inventories of materials stored

2. Certified payroll in accordance with current federal wage requirements of the Davis-Bacon Act.
 3. Updated Construction Schedule, as required
 4. O & M Manuals prior to application for payment exceeding 90% of Total
- E. Final Application for Payment
1. Record Drawings information
 2. Contractor's affidavit stating payment of subcontractors.
 3. Subcontractor's statements of being paid.
- F. Release of Retained Funds
1. Record and related contract closeout documents
 2. Affidavits of Payment (wages, subcontractors, taxes, etc.)
 3. L&I Certificate of Release for Public Works Contracts (worker's comp premiums)
 4. Employment Security Department release
 5. Department of Revenue Release for Taxes Paid

1.04 SUBMITTAL OF SHOP DRAWINGS AND SAMPLES

- A. General
1. Provide one set of legible electronic files (e.g. .pdf) of material and equipment submittals with submitted item(s) clearly marked. Engineer may also request a paper copy.
 2. Submission of shop drawings and samples shall be accompanied by one original transmittal letter containing project name, Contractor's name, number of drawings and samples, titles and other pertinent data.
 3. Contractor shall maintain a complete material list and file of Engineer reviewed submittals at the project site for use as reference by subcontractors, Owner, Engineer, Field Representative and other authorized parties.
 4. Submittals must be for equipment and materials that meet or exceed the specifications.
 5. Submittals must be, in the sole judgment of the Engineer, acceptable by the second submittal. The Contractor will be responsible for the cost of review, as solely determined by the Engineer, for all reviews after the second review. Such costs will be deducted from payments otherwise due under the Contract.
 6. Shop drawings and material and equipment submittals shall bear the Contractor's certification that he has reviewed, checked and approved each submittal, and that each is in conformance with the requirements of the contract. Submittals not bearing this certification will be immediately returned to Contractor without review. Submittals containing more than three defects may be returned to Contractor without further review for correction/resubmission.

B. Shop Drawings

In addition to the requirements identified in General Conditions Section 5 Shop Drawings,

or elsewhere in the Plans and Specifications, Contractor shall provide:

1. Submittal of Product Certificates
 - a. Where manufacturer certificates are specified to be furnished attesting to conformance with specification requirements, submit certificates in triplicate prior to acceptance of the Work.
2. Warranties
 - a. Provide warranties, guarantees and/or maintenance agreements where the Specifications require a period longer than the Contractor warranty period.

1.05 CONTRACT CLOSEOUT SUBMITTALS:

- A. Operation and Maintenance:
 1. Furnish instructions and data on materials and equipment installed in the work in accordance with the requirements of the technical specifications.
 2. Provide three (3) paper copies and one electronic file (e.g. .pdf). Each set shall be bound in separate commercial quality three-ring binders with durable and cleanable plastic covers. The words "Operation and Maintenance Manual" along with the type of equipment covered shall be typed or neatly printed on the cover.
 3. Each set shall be complete with an index and, as a minimum, cover the following items:
 - a. Name, location and telephone number of manufacturer and product's model number.
 - b. Name, location and telephone number of nearest supplier and spare parts warehouse.
 - c. Start-up procedures and normal operating characteristics and instruction.
 - d. Regulation, control, shut-down and emergency instructions.
 - e. Recommended preventative maintenance procedures including lubrication schedule with recommended lubricants.
 - f. Trouble-shooting guide.
 - g. Complete nomenclature and commercial number of all parts including exploded views of each assembly.
 - h. List of recommended spare parts.
 - i. Complete as-built elementary wiring and outline diagrams.
 - j. Statements of warranty or guarantee.
 4. Operation and Maintenance Manuals shall be submitted in at least draft form for Engineer's review with Shop Drawings, Catalog Cuts and other material submittal data. Final drafts, incorporating Engineer's comments, shall be submitted prior to Contractor's application of payment for 90 percent or more of the work.
 5. Contractor shall maintain a complete file of all Engineer reviewed Operation and Maintenance Manuals at the project site for use as a reference by interested parties.

PART 2. MATERIALS (NOT USED)

PART 3. EXECUTION (NOT USED)

***** END OF SECTION *****

SECTION 01 41 00 – REGULATORY REQUIREMENTS

PART 1. GENERAL

1.01 GENERAL

- A. Contractor shall comply with and give notices required by all federal, state, and local laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work.
- B. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER will be responsible for monitoring CONTRACTOR'S compliance with any Laws and Regulations.
- C. Contractor shall inform in a timely manner the Owner, Labor & Industries and other authorities of any changes in the work which may affect or be affected by codes and laws. This includes contract modifications, amendments, additions, shop drawings, and the like, current as of Project Manual date.

1.02 SECTION INCLUDES

- A. Make any and all adjustments and modifications as required to conform to ordinances, and regulations.
- B. Referenced codes establish minimum requirement levels. Where provisions of various codes or standards conflict, the more stringent provisions govern. Promptly submit to Engineer written notice of observed contract document variations from legal requirements.
- C. Compliance requirements include, but are not limited to following:
 - 1. International Building Code and Related Standards, most recent edition, published by the International Conference of Building Officials.
 - 2. Department of Labor and Industries Regulations.
 - 3. Environmental Requirements: All work to be performed in compliance with relevant statutes and regulations dealing with prevention of environmental pollution and preservation of public natural resources.
 - 4. Standard Specifications for Road and Bridge Construction, Washington State Department of Transportation, (WSDOT) current edition.
 - 5. Standard Specifications for Municipal Public Works Construction, Washington State Chapter, American Public Works Association, most recent edition.

1.03 INADVERTENT DISCOVERY PLAN (IDP) - HISTORIC PRESERVATION

- A. Any excavation or other earth moving activity by the contractor that uncovers significant cultural resources including historical or archaeological artifacts, human or cultural items, or fossil or other paleontological materials, shall be immediately reported as follows:
 - 1. If earth disturbing activities during project construction uncover cultural materials (i.e. structural remains, historic artifacts, or prehistoric artifacts), all work shall cease at the affected location and the Owner and Engineer shall be notified immediately. The Owner will contact the Washington State Archaeologist at the Department of Archaeology and Historic Preservation (DAHP) as appropriate.
 - 2. If earth disturbing activities during any area of the project uncover human remains, all work shall cease at the affected location immediately in accordance with the

Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) and Washington State Statute RCW 27.44. The area around the discovery shall be secured and the Whatcom County Coroner shall be notified immediately. The Owner shall notify the State Archeologist at DAHP and the appropriate tribes.

3. Construction shall be halted or shifted to a new location pending the notification process and further instructions issued by the Owner after consultation with the State Historic Preservation Officer, applicable Indian Tribes, and other appropriate authorities, as appropriate.

1.04 MISCELLANEOUS EXPLANATIONS/INTENT

- A. Number of Specified Items Required: Wherever in these Specifications an article, device, or piece of equipment is referred to in the singular number, the reference applies to as many such articles as are shown on the Drawings or required to complete the installation.
- B. Drawings/Diagrammatic:
 1. Drawings are in part diagrammatic and do not necessarily show complete details of construction, work or materials, performance or installation. And they do not necessarily show how construction details, other items or work, fixtures, and equipment may affect any particular installation. Contractor is required to ascertain and correlate the work to bring the parts together into a satisfactory and completed whole.
- C. Furnish and install work not covered under any heading, Section, branch, class or trade of the project manual, but shown on or reasonably inferable from the Drawings. This includes all work necessary to produce the intended results. Install similarly for items more positively indicated.
- D. Wording of these Specifications: These Specifications are of the abbreviated or streamlined type and may include incomplete sentences.
- E. Words such as "shall", "the Contractor shall", "shall be", and similar mandatory phrases, are required to be supplied by inference in the same manner as they are in a note on the Drawings.
 1. Provide all items, articles, materials, and operations listed, including all labor, materials, equipment and incidentals, required for their completion.
- F. Tense, Gender, Singular, Plural: Present tense words include future tense. Words in masculine gender include feminine and neuter genders. Words in the singular include plural. Plural words include singular.
- G. All, Entire, and the Like: For brevity throughout the documents, these words may be omitted. Read their implications into all work.
- H. Specifications by Reference: Any material specified by reference or number, symbol or title of a specified standard, such as commercial standard, ANSI and ASTM documents, Federal Specifications, trade association standard, or the like, shall comply with the following:
 1. The latest revision requirements thereof, and any amendment or supplement thereto, in effect on Bid date or date of Owner-Contractor Agreement when there are no bids.
- I. Dimensions and Measurements on Drawings: Dimensions govern. Do not scale. Contractor is to check all dimensions in the field and verify them with respect to adjacent

or incorporated work. Large scale drawings take precedence over plans, elevations, and cross sections.

- J. First Class Workmanship: First Class Workmanship is expected.
 - 1. Prior to installing any item or material, verify that receiving surfaces are plumb, level, true to line, and straight to the degree necessary to achieve tolerances specified or required. Perform without extra cost all shimmering, blocking, grinding, or patching required to make such surfaces plumb, level, true to line, and straight.
 - 2. Take care in attention to details and fitting at intersections and junctures of materials. All joints are to be tight, straight, even, and smooth.
- K. Presence of Engineer/Owner: Do not misconstrue presence of this person or any of his representatives at the site as assuring compliance with Contract Documents.

PART 2. MATERIALS (NOT USED)

PART 3. EXECUTION (NOT USED)

*****END OF SECTION*****

SECTION 01 44 00 – QUALITY ASSURANCE/QUALITY CONTROL

PART 1. GENERAL

1.01 GENERAL

- A. Related Requirements Specified Elsewhere:
 - 1. Submittal Procedures: Section 01 33 00
 - 2. Project Closeout: Section 01 70 00
 - 3. Technical Specifications for certain items of work:
 - a. Section 03 30 00 Cast-in-Place Concrete
 - b. Section 31 23 33 Trench Excavation and Backfill
 - c. Section 32 12 16 Asphalt Pavement
 - d. Section 33 05 63 Precast Concrete Utility Structures
 - e. Section 33 10 00 Potable Water Systems
 - f. Section 33 16 33 Concrete Water Reservoirs
 - g. Section 33 35 00 Gravity Sewer Piping
 - h. Section 33 41 00 Storm Utility Drainage Piping
- B. Description of Section:
 - 1. Inspection and testing laboratory qualifications, duties and responsibilities.
 - 2. Contractor's quality control requirements.

1.02 DEFINITIONS

- A. Factory Tests: Tests made on various products and component parts prior to shipment to the job site, including but not limited to such items as electrical equipment, and pre-cast concrete.
- B. Field Tests: Tests or analyses made at, or in the vicinity of the job site in connection with the actual construction.
- C. Manufacturer's Certificate of Conformance or Compliance: A certificate signed by an authorized manufacturer's official attesting that the material or equipment delivered meets the specification requirements.

1.03 REGULATORY REQUIREMENTS:

- A. Nothing in the Drawings or Specifications shall be construed to permit Work not conforming to applicable laws, ordinances, rules or regulations.
- B. When Drawings or Specifications exceed requirements of applicable laws, ordinances, rules, or regulations, comply with documents establishing the more stringent requirements.

1.04 QUALITY CONTROL REQUIREMENTS

- A. All work under the contract shall be inspected and tested as required by the technical sections specified herein. The Contractor shall maintain records of all inspections and tests. Approvals, except those required for field inspections, field applications, and field tests, shall be obtained before delivery of materials and equipment to the project site.

- B. The Engineer or their representative shall be present for all pressure tests and leakage tests. Contractor shall give not less than 48 hours' notice in advance of these tests.
- C. Responsibility for quality control testing shall be as follows:
1. Factory Tests: Contractor will arrange and pay for factory tests.
 2. Factory Inspection: Contractor will arrange and pay for factory inspection.
 3. Field Inspection and Tests by the Contractor: Unless otherwise specified, the Contractor shall furnish all equipment, instruments, qualified personnel, independent laboratory services, and facilities necessary to inspect all work and perform all tests when required by the contract documents.
 4. Approval of Testing Laboratories: All laboratory work under this contract shall be performed by laboratories independent from the Contractor and approved by the Owner. The basis of approval includes the laboratories' experience, references, and qualifications.
 5. Materials Testing Laboratory: Owner will engage a materials testing laboratory to perform concrete, reinforcement rebar inspection, and asphalt testing and in-place density testing of bearing soils and backfills. Contractor shall provide cooperation, complete access, and necessary scheduling information to the Owner's testing laboratory.
- D. Laboratory Reports: Reports shall cite the contract requirements, the test or analysis procedures used, the actual test results, and include a statement that the item tested or analyzed conforms or fails to conform to the specifications requirements. A representative of the testing laboratory authorized to sign certified test reports shall sign all test reports. The Engineer shall receive immediate and direct delivery of the signed original of all reports, certifications, and other documentation, with the Contractor receiving copies concurrently.
- E. Repeated Tests and Inspections: The Contractor shall repeat tests and inspections after each correction made to nonconforming materials and workmanship until tests and inspections indicate the materials, equipment, and workmanship conform to the contract requirements. Re-testing and re-inspection costs after the first failure shall be performed at the Contractor's sole expense and shall be deducted from payments otherwise owed to Contractor.
- F. Concealed Work. The Contractor shall not conceal work that requires laboratory testing until test results meeting the project specifications have been received. When directed by the Engineer the Contractor shall open for inspection any part of the work that has been concealed. Should the Contractor refuse or neglect such a request, the Owner may employ any other person to open up the same or do so himself. If any part of the work has been concealed in violation of the Engineer's instruction or, if on being opened, it is found not to be in accordance with the terms of the Contract Documents the expense of opening and recovering, whether done by the Contractor or not, shall be charged to the Contractor. If the work has been concealed but not in violation of the Engineer's instructions and is found to be in accordance with the terms of the Contract Documents, the actual necessary expense of opening and recovering done by the Contractor shall be considered as extra work and paid for accordingly.
- G. NOTICES. The Contractor shall notify the Engineer and the Owner's Testing Laboratory not less than 48 hours before specific tests and inspections are expected to be required.

1.05 CONSTRUCTION SURVEILLANCE BY ENGINEER

A. Appointment.

1. The Owner and Engineer may appoint a field representative for surveillance of any and all portions of the work. Such surveillance may extend to any or all parts of the work, and to the preparation or manufacture of materials to be used.

B. Authority of Field Representative.

1. Field Representative is not authorized to revoke, alter, enlarge or relax the provisions of the Contract Documents, and is placed on the work to keep the Engineer informed as to the progress of the work and the manner in which it is being done.
2. Field Representative may also call the attention of the Contractor to any deviations from the plans or specifications. Failure of the Engineer or her representative to call the attention of the Contractor to faulty work or deviation from the Contract Documents shall not constitute acceptance of said work.
3. Field Representative is not authorized to approve or accept any portions of the work or to issue instructions contrary to the Contract Documents.
4. Field Representative will exercise only such additional authority as may be specially delegated to him by the Engineer, notice of which will be given in writing to the Contractor.

1.06 DEFECTIVE WORK

- A. The Contractor shall remove and replace any work found defective or not complying with requirements of Contract Documents, at no additional cost to Owner. Work will be checked as it progresses, but failure to detect any defective work or materials shall not in any way prevent later rejection when such defect is discovered, nor shall it obligate the Engineer for final acceptance.

PART 2. MATERIALS (NOT USED)

PART 3. EXECUTION (NOT USED)

***** END OF SECTION *****

SECTION 01 51 00 - TEMPORARY UTILITIES

PART 1. GENERAL

1.01 GENERAL

- A. The Contractor shall provide all arrangements, material and labor needed for obtaining temporary utility services.
- B. The Contractor is encouraged but not required to maintain a field office, but water and sanitation facilities must be provided for the Contractor's employees and subcontractors.
- C. Make all connections to the utility purveyor's requirements and in accordance with code requirements; remove from site upon completion of all work or when directed.

1.02 POWER

- A. The Contractor shall provide all temporary lighting and temporary power, including pole or poles, transformer if required, for construction.

1.03 TELEPHONE

- A. The Contractor's field superintendent shall be directly reachable at the project site by cellular phone.

1.04 WATER

- A. The Contractor shall make arrangements to obtain water required for the work from the Owner in accordance with Section 00700 General Conditions Section 5.14. The Contractor shall provide a meter for temporary connections. Connections shall be secured to prevent unauthorized water use during Contractor's absence.
- B. The Contractor shall provide piping, hose, backflow preventer approved for potable use, valving, meter, nozzles and other accessories required. Contractor shall provide recent (within last 6 months) Certification of backflow device testing.
- C. At completion, or before if directed, disconnect temporary connections and piping and remove from site.
- D. For drinking water, provide from proven safe source, for all those connected with the work in accordance with WISHA and Health Department requirements.

1.05 SANITARY SERVICE

- A. The Contractor shall provide temporary restroom services at the field office location, or other centrally located site. Service may be provided by contract service. Facilities shall be regularly serviced and maintained, and kept reasonably clean. Facilities shall be promptly removed at the conclusion of the work.

1.06 FIRST AID

- A. In accordance with requirements of 296-24 WAC, furnish personnel trained in first aid and certified as approved by Washington Department of Labor and Industries.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

***** END OF SECTION *****

SECTION 01 52 00 – SITE ACCESS AND STORAGE

PART 1. GENERAL

1.01 GENERAL

- A. The Contractor shall make all necessary arrangements to provide for safe and secure site access and storage.
- B. The primary construction access to the site shall be through Camp Firwood, 1740 Lake Whatcom Boulevard, Bellingham, as shown in the Construction Plans. Regular project access through Sudden Valley via Swallow Circle is not allowed.
- C. The primary construction access route gravel drive through Camp Firwood shall be maintained and restored to pre-construction conditions prior to Final Completion.
- D. The District has obtained temporary construction easements from the property owner for potential staging and stockpiling at the locations shown in the Construction Plans. Staging and stockpiling shall be limited to these areas, or areas of existing established gravel access that will not impede access through the site or to/from the nearby wireless communications tower site.

1.02 SUBMITTALS

- A. Submittals shall be in accordance with requirements of Section 01 33 00 and as specified. In addition, the following specific information shall be provided:
 - 1. Project-specific Traffic Control Plan, IF required for Sudden Valley Community Association Encroachment Permit.
 - 2. Hazardous Materials Storage and Disposal Plan.

1.03 MAINTENANCE OF TRAFFIC

- A. General: Nothing herein shall be construed to entitle the Contractor to the exclusive use of any public street, alleyway, or parking area during the performance of the work hereunder, and it shall so conduct its operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleyways, or parking areas. The Contractor shall provide unimpeded access through the project limits for emergency vehicles and make every effort to provide minimum delay to United States Postal Service vehicles, school buses, and garbage collection vehicles.
- B. Work within Sudden Valley rights-of-way requires an Encroachment Permit from the Sudden Valley Community Association (telephone (360-746-8431). The Contractor shall furnish the Owner with a copy of the final issued permit. A draft of the permit is included in the Appendices of the Project Manual. ***If required as a condition of the permit, the Contractor shall produce a project-specific Traffic Control Plan.***
- C. If needed, the Contractor shall submit three (3) copies of a traffic control plan(s) to the Engineer and Sudden Valley for approval a minimum of two (2) weeks prior to construction. The Engineer reserves the right to observe these traffic control plans in use and to make any changes as field conditions warrant. Any changes shall supersede these plans and be done solely at the Contractor's expense.
- D. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise indicated. Toe boards shall be provided to retain excavated material if required by the Engineer or the agency

having jurisdiction over the street. Temporary provisions shall be made by the Contractor to assure the use of sidewalks and the proper functioning of all gutters, storm drain inlets, and other drainage facilities.

- E. Fire hydrants on or adjacent to the work shall be kept accessible to fire-fighting equipment at all times. Fire Hydrants taken out of service shall be bagged and visibly marked as out of service and the Fire Department shall be notified when hydrants are removed from service (even if temporary).
- F. The Contractor's equipment shall stop at all points of intersection with the traveling public unless satisfactory traffic control measures, approved in writing by the Engineer, are installed and maintained at Contractor's expense.
- G. When the Contractor is required to maintain traffic through grading, roadway excavation and embankment areas, the construction shall be conducted in such a manner as to provide a reasonably smooth and even surface satisfactory for use by public traffic at all times. The surface of the roadbed shall be properly crowned for drainage. In advance of other grading operations, sufficient fill shall be placed at culverts and bridges to permit traffic to cross unimpeded. Part width construction techniques shall be employed when the traffic is routed through roadway cuts or over embankments under construction. The material shall be excavated or placed in layers and the construction activities shall be alternated from one side to the other, with traffic routed over the side opposite the one under construction.
- H. When, in the opinion of the Engineer, conditions are such that the safety and/or convenience of the traveling public is adversely affected, the Contractor will be immediately notified in writing. The notice will state the defect(s) and the corrective action(s) required. In the event that the Contractor neglects to take immediate corrective action, the Engineer may suspend all work on the project until satisfactory corrective action is performed. In the event the Contractor does not take corrective action within 24 hours, the Engineer may order such work as deemed necessary for public convenience and safety accomplished by outside forces. The cost of this work shall be deducted from any monies due or that may become due under the terms of the contract.
- I. The Contractor shall bear all expense of maintaining the traffic over the section of road undergoing improvement, including dust control, and of constructing and maintaining such approaches, crossings, intersections, and other features as may be necessary, without direct compensation.
- J. Traffic Control: All locations requiring redirection or stopping of the traveling public shall be properly signed and/or flagged by the Contractor. For the protection of traffic in public or private streets and ways, the Contractor shall provide flagmen and provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights, and other safety devices in accordance with the requirements of the "Manual of Uniform Traffic Control Devices, Part VI Traffic Controls for Street and Highway Construction and Maintenance Operations," (MUTCD) published by U.S. Department of Transportation, Federal Highway Administration (ANSI D6.1) with the current State of Washington supplements and Whatcom County requirements.
- K. The Contractor shall take all necessary precautions for the protection of the work and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. The Contractor shall station such guards or flaggers and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. All signs, signals, and barricades shall conform to the requirements of Subpart G, Part

1926, of the OSHA Safety and Health Standards for Construction.

- L. Special pedestrian detours are often necessary in areas adjacent to new construction or demolition of existing structures. The Engineer shall determine when walkways are required. Plans for walkways must be approved by the Engineer.
- M. The Contractor shall remove traffic control devices when no longer needed, repair all damage caused by installation of the devices, and shall remove post settings and backfill the resulting holes to match grade.
- N. The Contractor shall notify the Sheriff/Police and Fire Departments and any other affected agency (e.g. School District) of all planned street closures. Notification shall consist of giving the time of commencement and proposed date of completion of work and names of street, schedule of operations, and routes of detours. Such notification shall be given at least 48 hours before such closure is to take effect.
- O. Temporary Driveway Closure: The Contractor shall maintain access to all residential, commercial and street approaches. Any temporary closures shall require prior approval by the Engineer. The Contractor shall notify the owner or occupant (if not owner occupied) of the closure of the driveways to be closed more than one (1) eight-hour workday at least three (3) working days prior to the closure. The Contractor shall minimize the inconvenience and minimize the time period that the driveways will be closed. The Contractor shall fully explain to the owner/occupant how long the work will take and when closure is to start.
- P. Contractor shall provide flaggers to control traffic during lane closures, truck ingress/egress to the work site, or other impediments to normal traffic flow. Flaggers shall be certified to work in the State of Washington. Provide proof of certification upon owner's request.
- Q. Fill excavations at the conclusion of work each day. Provide temporary patch over excavations in traveled way. If steel plates are used to close excavation, place asphalt patch against edge of plate to transition between plate and road surface.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Ship equipment in its original package to prevent damage or entrance of foreign matter. Perform all handling and shipping in accordance with manufacturer's recommendations.
- B. Provide protective coverings during construction.
- C. Identify materials and equipment delivered to the Site to permit check against approved materials list, and reviewed submittals.

1.05 CONTRACTOR'S WORK AND STORAGE/STAGING AREA

- A. The District has obtained temporary construction easements for areas identified on the Project Plans for use in temporary material stockpiling and/or material and equipment storage. Any stockpiling or storage shall not impede access through the site or to/from the nearby tower site.
- B. The Contractor shall make its own arrangements for any additional necessary off-site storage and staging or shop areas necessary for the proper execution of the work. ALL PROJECT MATERIALS STORAGE AND STAGING AREAS SHALL BE REVIEWED AND APPROVED BY THE OWNER AND ENGINEER.
- C. Should the Contractor find it necessary to use any additional land for this storage or for other purposes during the construction of the work, it shall provide for the use of such lands

at its own expense. IF additional land beyond that coordinated and made readily available for storage or other purposes is needed at the project site, the contractor shall present a proposal and coordinate as needed with the district and the property owner.

- D. The Contractor shall construct and use a separate storage area for hazardous materials used in constructing the work.
1. For the purpose of this paragraph, hazardous materials to be stored in the separate area are all products labeled with any of the following terms: Warning, Caution, Poisonous, Toxic, Flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, two-part epoxy coatings, sealants, asphalt products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent. **The Contractor shall develop and submit to the Engineer a plan for storing and disposing of the materials above.**
 2. The Contractor shall obtain and submit to the Engineer a single EPA number for wastes generated at the site.
 3. The separate storage area shall meet all the requirements of all authorities having jurisdiction over the storage of hazardous materials.
 4. The separate storage area shall be inspected by the Engineer prior to construction of the area, upon completion of construction of the area, and upon cleanup and removal of the area.
 5. All hazardous materials that are delivered in containers shall be stored in the original containers until use. Hazardous materials that are delivered in bulk shall be stored in containers that meet the requirements of authorities having jurisdiction.

1.06 PARKING

- A. Parking is limited in the area. The Contractor shall direct its employees to park in areas that do not block driveways, impede traffic or disturb landscaping.
- B. Traffic and parking areas shall be maintained in a sound condition, free of excavated material, construction equipment, mud, and construction materials. The Contractor shall repair breaks, potholes, low areas that collect standing water, and other deficiencies.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION (NOT USED)

*****END OF SECTION*****

SECTION 01 56 00 - TEMPORARY BARRIERS, ENCLOSURES AND CONTROLS

PART 1. GENERAL

1.01 GENERAL

- A. The Contractor shall provide all necessary controls and aids necessary to provide a safe and orderly work environment in conformance with all applicable local, state and federal laws and codes.
- B. All controls implemented as part of the work shall comply with all applicable local, state and federal codes and laws.
- C. The Contractor shall furnish all labor, material and equipment needed as part of the controls described herein.
- D. The Contractor shall obtain any permit necessary to implement the controls described herein.

1.02 SUBMITTALS

- A. Submittals shall be in accordance with requirements of Section 01 33 00 Submittal Procedures and as specified. In addition, the following specific information shall be provided:
 - 1. Any TESC measures or BMPs that will or may be employed during construction including but not limited to (see Plans and Details):
 - a. Silt (Filter Fabric) Fence
 - b. Straw Wattle (not anticipated)
 - c. Orange Barrier Fencing
 - d. Geotextile Encased Check Dam

1.03 WASTE CONTROL

- A. General - The Contractor and each subcontractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. Clean work areas as required at the end of each day's work.
- B. Trash removal - Remove all trash and debris from site and properly dispose of at Contractor's expense. Allow no debris, broken or open cartons, or other refuse to collect in the project or around it; allow no flammable or hazardous materials to be stored on the site without approved protection precautions and procedures.
- C. Street and parking area cleaning - Immediately clean all spilled material which results from the work of this contract and waste hauling operations; use motorized equipment and hand labor as required. Remove from streets, driveways or parking areas in time to prevent such materials from affecting traffic or clogging street drainage system; clean any contaminated drains.

1.04 NOISE CONTROL

- A. Minimize unnecessary noise originating from construction employees, work, and equipment when working in the vicinity of residences

1.05 DUST CONTROL

- A. During the period of construction, the Contractor shall provide satisfactory means of controlling dust and dirt. If water is required to limit dust, its cost shall be considered incidental to the work.

1.06 RUNOFF CONTROL

- A. The Contractor shall install and maintain temporary measures to control the runoff water quality and reduce the transport of sediments off of the site during construction.
- B. All proposed measures shall comply with the requirements of Plans, Whatcom County, Sudden Valley Community Association, the District, and the Department of Ecology's Stormwater Management Manual for Western Washington.
- C. All proposed measures shall be approved by the Engineer prior to their installation unless such measures are required to correct a severe and immediate problem.

1.07 BARRIER REQUIREMENTS

- A. During construction, the Contractor shall at all times maintain satisfactory and substantial temporary fencing, railing, barricades or steel plates at all excavations, obstructions or other hazards. All such barriers shall have warning signs or lights as necessary for safety.
- B. The Contractor is responsible for supplying and erecting new fencing where shown, and where existing fencing is removed or damaged by construction activities.

PART 2. MATERIALS (NOT USED)

PART 3. EXECUTION (NOT USED)

***** END OF SECTION *****

SECTION 01 60 00 - MATERIAL AND EQUIPMENT

PART 1. GENERAL

1.01 DESCRIPTION OF SECTION

- A. General requirements for providing transportation, handling, storage, and protection of materials and equipment.
- B. Contractor's options in selection of products and manufacturers, and procedures for consideration of proposed substitutions.
- C. All material and equipment incorporated into the work:
 - 1. Shall be new, free from defects and of equal or superior quality as specified herein and on the drawings.
 - 2. Shall be the products of established manufacturers regularly engaged in the fabrication of such equipment.
 - 3. Shall comply with the size, type and quality specified and shall be designed for use in the particular application.
 - 4. Shall be designed, fabricated and assembled in accordance with standard engineering and shop practice.
 - 5. Shall be complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and for intended use and effect.

1.02 RELATED SECTIONS

- A. Related Requirements Specified Elsewhere:
 - 1. Section 01 33 00 – Submittal Procedures
 - 2. Section 01 44 00 - Quality Assurance/Quality Control

1.03 MANUFACTURER'S INSTRUCTIONS

- A. Installation of all materials and equipment shall comply with manufacturer's printed instructions. The Contractor shall have the responsibility to distribute copies of such instructions to all parties involved in the installation, including the Owner. One complete set of instructions shall be maintained on the job site during installation and until completion.
- B. All materials and equipment shall be handled, installed, connected, cleaned, conditioned and adjusted in strict accordance with such instructions and in conformance with the specified requirements. The Owner should be immediately notified should job conditions or specified requirements conflict with the manufacturer's instructions.

1.04 TRANSPORTATION AND HANDLING

- A. All materials and equipment shall be transported and handled in such a manner as to prevent any damage.
- B. Deliveries of products shall be in accordance with construction schedules as to cause no delay in the work or to conflict with work and conditions at the site.
- C. Products shall be delivered in the manufacturer's original containers with identifying labels intact and legible. Where materials are specified to conform to ASTM, Federal or other

reference specifications, the materials shall be delivered to the site bearing the manufacturer's label stating that the materials meet the requirement of such referenced specifications.

- D. Products shall be inspected immediately upon delivery to assure compliance with specified requirements and approved submittals and that products are properly protected and undamaged.
- E. The Contractor shall provide personnel and equipment to receive and unload products delivered to the site. No products shall be delivered to the site unless such forces are available.

1.05 STORAGE AND PROTECTION

- A. Contractor is fully responsible for safe storage of all materials and equipment.
- B. All products shall be stored in strict accordance with the manufacturer's instructions, with seals and labels intact and legible.
- C. All products shall be arranged in a neat order and protected from damage from the weather, traffic and construction operations. Easy access for periodic inspection shall be provided.

1.06 PRODUCTS AND SUBSTITUTIONS

- A. Products:
 - 1. Where available, provide standard products of types which have been produced and used previously and successfully on other projects and in similar application.
 - 2. Where additional amounts of a product, by nature of its application, are likely to be needed by Owner at a later date for maintenance and repair or replacement work, provide a standard, domestically produced product which is likely to be available to Owner at such later date.
 - 3. For Products specified only by a reference standard, the Contractor may select any product meeting that standard.
 - 4. Where the make or name of a material is specified in the written documents or on the drawings, it is to establish a quality standard in that particular field of manufacture. Requests for substitutions of materials of other makes or names must be submitted to the Owner and must receive favorable written response from the Owner prior to ordering, furnishing or installing the proposed substitution item.
- B. Requests for Substitutions:
 - 1. For a period of thirty (30) days after the Contract Date, the Owner will consider written requests from the Contractor for substitution of Products.
 - 2. Requests for each Product substitution shall be submitted separately. Requests for substitutions will be received and considered when revisions to contract documents are not required, and the product or material is in keeping with the general intent of the Contract Documents.
 - 3. A request for substitution by the Contractor constitutes a representation that the Contractor:
 - a. Will provide the same warranties or bonds for the substituted item as for the Product specified.

- b. Will coordinate the installation of an accepted substitution into the work and make all other changes as required to make the work complete in all respects.
 - 4. Submit an electronic file (e.g. .pdf) of requests for substitutions, fully identified for Product or method being replaced by substitution, including related specification section and drawing number(s), and fully documented to show compliance with requirements for substitutions.
 - 5. Include product data/drawings, description of methods, samples where applicable, Contractor's detailed comparison of significant qualities between specified item and proposed substitution, statement of effect on construction time and coordination with other affected work, cost information or proposal, and Contractor's statement to the effect that proposed substitution will result in overall work equal-to-or-better-than work originally indicated.
- C. The contractor agrees to pay all Engineering costs accruing as a result of checking and/or redesign due to substitutions. These costs will be charged to the Contractor and will be considered incidental to the contract price.
- D. Owner's Review
- 1. Within two weeks of receipt of request, or within one week of receipt of requested additional information or documentation (whichever is later), the Owner will notify the Contractor of either his acceptance or his rejection of the proposed substitution. Rejection will include statement of the reasons for rejection (non-compliance with the requirements for requested substitutions, or other reasons as detailed.)

PART 2. MATERIALS (NOT USED)

PART 3. EXECUTION (NOT USED)

***** END OF SECTION *****

SECTION 01 65 00 – COMMISSIONING OF FACILITIES

PART 1. GENERAL

1.01 GENERAL

- A. Related Requirements Specified Elsewhere:
 - 1. Section 01 33 00 – Submittal Procedures
 - 2. Section 01 70 00 – Contract Closeout
 - 3. Electrical and Controls Sections
- B. Description of Section:
 - 1. Specific commissioning procedures and start-up requirements.
 - 2. Requirements for equipment settings and field verification.
 - 3. The listing of procedures and field tests is given generally as a checklist for the Contractor's convenience. The Owner reserves the right to add to this list. This list is not an exhaustive listing of all applicable settings and requirements to achieve specified results.
 - 4. The Contractor shall comply with all contract requirements prior to contract closeout, including specific administrative procedures, and closeout submittals at substantial completion and at final acceptance of the work.
- C. Contractor is responsible for coordinating with the Control System Integrator regarding all commissioning activities, including but not limited to: checking alarm systems, checking full functionality and troubleshooting connected devices as needed (level sensors, float switches, flow meter, Shake Alert telemetry/control panel, actuated valve, rain gauge, intrusion switches), checking hardware.

1.02 COMMISSIONING RESERVOIR SEISMIC VALVE AND INSTRUMENTATION

- A. The Control System Integrator is to provide a minimum of two (2) 8-hour days of installation supervision, start-up supervision and operator training. Supervision and training duties to include the following:
 - 1. Inspect installation for concurrence to design.
 - 2. Make sure equipment is installed to allow access to all components.
 - 3. Follow start-up procedures as recommended by manufacturers. Start-up procedures, at a minimum, will include the following:
 - a. Confirm that actuated valve and controls function as intended. Adjust as needed.
 - b. Confirm level sensor settings and all associated control and alarms.
 - c. Confirm and calibrate electromagnetic flow meter. Check associated control and alarms.
 - d. Confirm functionality, control and alarm of high-level float switches.
 - e. Confirm rain gauge data collection.

- f. Check all intrusion switches and alarms.
- 4. Review Operation and Maintenance Manual with personnel.
- 5. Demonstration and Training on controls.

*****END OF SECTION*****

SECTION 01 70 00 - PROJECT CLOSE-OUT

PART 1. GENERAL

1.01 GENERAL

- A. The time for Substantial Completion is defined in Bid Proposal, Section 00410, for this project. For this project to be considered Substantially Complete, the new reservoirs and all associated water, storm drain, sewer piping and all appurtenances shall be installed, successfully tested and in full operation, all pavement restoration complete, and at least 90% of other surface restoration shall be complete. Final landscaping including plantings do not need to be complete for substantial completion.
- B. When the Contractor considers the work to be substantially complete, submit the following materials to the Engineer:
 - 1. Written notice that the work, or designated portion thereof, is substantially complete.
 - 2. List of items to be completed or corrected and reasons for being incomplete. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents.
- C. Upon receipt of Contractor's request, Engineer will either proceed with inspection or advise Contractor of prerequisites not fulfilled. Following initial inspection, Engineer will either prepare certificate of Substantial Completion, or advise Contractor of work which must be performed prior to issuance of certificate; and repeat inspection when requested and assured that work has been substantially completed. Results of completed inspection will form the initial "punch list" for final acceptance.
- D. When the Engineer, on the basis of an inspection, concurs that the work is substantially complete, he will prepare and deliver to the Owner and Contractor a certificate of Substantial Completion accompanied by the Contractor's list of items to be completed or corrected, as verified and amended by the Engineer. The Certificate of Substantial Completion shall state the responsibilities of the Owner and Contractor for security, maintenance, utilities, and damages to the work and insurance, and shall fix the time within which the Contractor shall complete the items listed therein.
- E. The certificate of Substantial Completion is submitted to the Owner and Contractor for their written acceptance of their responsibilities as stated therein. The date of substantial completion shall be the date the Owner executes the Certificate of Substantial Completion.

1.02 RECORD OF WORK PERFORMED

- A. During the construction period, Contractor shall maintain a complete log for the purpose of maintaining a day-by-day record of installed information. This information shall include, but not be limited to: as-built locations of any buried utility encountered, and all approved deviations from the plans and specifications.
- B. Addenda, bulletins, field orders, and change orders shall be posted and referenced in the record set of prints.
- C. Contractor may not make application for payment for more than 90% of the work until record (as-built) drawings have been submitted to the Engineer.

1.03 FINAL CLEAN-UP

- A. At the completion of the work, the Contractor shall leave the premises in a neat and unobstructed condition, ready for Owner occupancy.

1.04 FINAL INSPECTION

- A. When the Contractor considers ALL work to be complete, he shall submit written notice to the Engineer that the work has been completed and inspected in compliance with the Contract Documents (including punchlist items) and requesting a contract completion inspection.
- B. When the Engineer on the basis of an inspection concurs that the work is acceptable under the Contract Documents, he will notify the Contractor in writing and request the Contractor to provide any remaining submittals.
- C. Should the Engineer determine that the work is not acceptable under the Contract Documents, he will provide the Contractor with written notification of the deficiencies.
- D. The Contractor shall remedy the deficiencies in the work and submit a new written notice for final inspection to the Engineer.

1.05 FINAL COMPLETION

- A. Follow steps defined above for completion of remaining work, including delivering all project documentation and spare parts. The results of the Engineer's inspection shall for the initial "punch list" for final completion.
- B. Contractor shall complete all requirements to close out the Sudden Valley Community Association Right-of-Way Encroachment Permit.
- C. Contractor shall complete all requirements to close out Whatcom County permits.
- D. Contractor shall achieve Final Completion as identified on the Bid Proposal.

1.06 FINAL PAYMENT

- A. When the Contractor has satisfied all requirements of this section and all other conditions of the Contract Documents, the Contractor may submit a final Application for Payment. Should the Engineer determine the Work acceptable under the Contract Documents and the Agreement fully performed, he will promptly issue a final Certificate for Payment. Any funds which may be withheld from Contractor under the terms of the contract will be identified, and the Owner will prepare a final certificate of payment reflecting the balance due and payable to the Contractor.
- B. The accumulated retainage shall not be paid until the Contractor submits to the Owner:
 - 1. Contractor's affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work for which the Owner might in any way be responsible, have been paid or otherwise settled.
 - 2. Release of Lien - One will be required from each lien holder who has duly filed a notice of claim with the Owner. If any liens remain unsatisfied after the expiration of the statutory lien period, the Contractor shall refund the Owner all amounts that the Owner may be compelled to pay in discharging such lien including all costs and reasonable attorney's fees.
 - 3. State Department of Revenue form that all taxes have been paid.
 - 4. State Department of Labor and Industry affidavit of wages paid.

C. The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

1. Unsettled liens or disputes.
2. Faulty or defective work appearing after Substantial Completion under the project guarantee and equipment warranty period.
3. Failure of the work to comply with the requirements of the Contract Documents.
4. Terms of any special warranties required by the Contract Documents.

The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the final Application for Payment.

PART 2. MATERIALS (NOT USED)

PART 3. EXECUTION (NOT USED)

***** END OF SECTION *****

SECTION 02 41 00 - DEMOLITION

PART 1. GENERAL

1.01 DESCRIPTION

- A. Description of System: The work covered by this section includes the furnishing of all plant, labor, equipment, and materials necessary for the demolition, removal, rehabilitation and equipment salvage of all construction as specified herein and as shown on the drawings. Coordinate work with additional description and requirements described in Section 02 41 16 Reservoir Demolition.

1.02 DESCRIPTION

- A. Related Work Specified Elsewhere
 - 1. Summary of Work: Section 01 10 00
 - 2. Reservoir Demolition: Section 02 41 16
 - 3. Potable Water Systems: Section 33 10 00
 - 4. Electrical specifications: Division 26
 - 5. Controls specifications: Division 28

1.03 JOB CONDITIONS

- A. The major items of demolition work are shown on the drawings.
- B. All removed equipment, materials, and debris, unless otherwise noted or requested by the Owner, shall become the property of the Contractor. The Contractor shall deliver all items to be salvaged (as directed by the Owner), to the Owner's Maintenance Shop, unless otherwise specified in the contract documents.
- C. Protection: Ensure the safe passage of persons around the area of demolition. Protect in place all equipment to remain. Conduct operations to prevent injury to adjacent buildings, structures, other facilities, and people and livestock.
- D. Site Access: Primary site access for demolition work is limited to the Camp Firwood project construction access as shown in the Plan. Regular access via Sudden Valley Community Association roadways is prohibited.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION

3.01 DEMOLITION

- A. Pollution Controls:
 - 1. Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical

level. Protect in place, with all necessary temporary covers, all equipment to remain.

2. Comply with governing regulations pertaining to environmental protection.

B. Removal Requirements:

1. Provide complete removal and disposal of all equipment identified for demolition. Salvage items as directed by the Owner.

C. Sequence of Demolition:

1. Contractor is to coordinate demolition with Owner operations via the Sequence and Phasing Plan specified in Section 01 10 00 1.04.

D. Equipment to be Demolished:

1. Existing reservoir vault structure and associated piping as shown on the Plans.
2. Existing water piping as shown on the Plans.
3. Existing reservoir electrical and control panels, and other reservoir appurtenances.
4. Salvage any removed items to the Owner, at Owners request. All non-salvaged items to be disposed of by the Contractor.
5. See electrical and/or controls drawings and specifications for additional demolition items/requirements.

3.02 DISPOSAL OF DEMOLISHED MATERIALS

- A. General. Remove from the site debris, rubbish, and other materials resulting from demolition operations. Burning or burying of removed materials from demolished structures will not be permitted on the site. Comply with all federal, state, and local regulations regarding hauling and disposal.
- B. Removal. Transport materials removed from demolished structures and dispose of at a legal disposal site in accordance with all federal, state, and local regulations.

*****END OF SECTION*****

SECTION 02 41 16 – RESERVOIR DEMOLITION

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Work includes but is not limited to following:
 - 1. Demolition, load, haul, and disposal of the existing Division 7 Reservoir to the limits shown on the Plans, regardless of actual quantities. Coating samples have been taken from the interior and exterior steel and tested for Total Metals. The results are provided in Appendix D. Contractor should anticipate that metals content of coatings in the field may be up to 400-percent of the amounts provided in Appendix D. Concrete samples have been taken from the base and tested for Asbestos. The results indicate no asbestos and are provided in Appendix D.
 - 2. Furnishing all labor, materials, equipment, permits, and related items required to remove all structures and abate all substances on those structures including, but not limited to the reservoir.
 - 3. Note Site Access limitations below in Section 3.01.

1.02 RELATED SECTIONS

- A. Related work specified elsewhere, including but not limited to following:
 - 1. Section 01 11 00 – Special Project Procedures
 - 2. Section 01 44 00 - Quality Assurance / Quality Control
 - 3. Section 02 41 00 - Demolition

1.03 SUBMITTALS PRIOR TO CONSTRUCTION

- A. Contractor shall provide a description of the demolition activities and procedures including sequence and safety procedures. The submittal shall provide methods for testing and demolition as well as the waste hauler and location for lawful disposal, including their requirements for acceptance of the materials.
- B. Product Data Sheets and Safety Data Sheets for all chemical products used on site.
- C. Hazard and health monitoring plans as required. Refer also to the Safety and Health Plan requirement specified in Section 01 11 00 Special Project Procedures.
- D. Containment systems for control of dust, debris, and for prevention of hazardous materials from entering the ground or waterways.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION

3.01 GENERAL

- A. Items to be demolished and lawfully disposed of are shown on the Plans. Piping shall be removed to the extents shown on the Plans.
- B. The Contractor shall coordinate all demolition work with the Owner and Engineer. The Contractor shall be responsible for adhering to all applicable best practices, safety laws and

regulations.

- C. The Contractor shall sequence and perform the work to avoid damaging other facilities. Additionally, the Contractor shall limit the Work to the extents indicated on the Plans.
- D. The Contractor shall determine what materials to use and to not use in order to handle and dispose of hazardous materials that may be on site.
- E. Site Access: Primary site access for demolition work is limited to the Camp Firwood project construction access as shown in the Plan. Regular access via Sudden Valley Community Association roadways is prohibited.

3.02 HAZARDOUS MATERIALS

- A. Coating samples of the interior and exterior coating systems have been tested for RCRA 8 Total Metals content. The test results are provided in Appendix D. Total Metals content in the coatings will vary consistently around the reservoir and the Contractor shall anticipate that the metals content of coatings in the field may be up to 400-percent of the amounts provided in Appendix D.
- B. Contractor shall comply with the applicable laws, regulations, and codes of the Occupational Safety and Health Administration (OSHA), the Washington Industrial Safety and Health Act (WISHA), and any Federal, State, County or local requirements related to demolition, handling, loading, transporting, recycling, and/or disposal of the materials related to this Section of the Specifications.
- C. Contractor shall provide containment of all structures such that no dust leaves the work site and no hazardous materials come in contact with the ground or enter storm drains or surface waters. Should dust leave the site or materials come in contact with the ground or enter storm drains or surface waters, all work shall stop until such time as control over those materials has been reestablished and clean-up of the violating materials has been completed to the satisfaction of the Owner.
- D. Contractor shall make all determinations regarding the ability to recycle the steel with the lead paint on the steel. No additional compensation will be allowed for using a lead abatement product such as Blastox, nor for having to remove the lead-based paint prior to recycling.
- E. Contractor shall be responsible for all testing and reporting required and shall provide all test results and letters showing acceptance of all materials removed from the site by recyclers or landfills.

3.03 DEMOLITION AND SALVAGE OR RECYCLING

- A. The Contractor shall be responsible for obtaining all permits required to perform the work including, but not limited to electrical, demolition, hauling, and disposal of all materials as well as complying with all permit requirements. The District will obtain and pay for the Whatcom County Demolition Permit only. The Contractor is responsible for complying with all requirements of the Demolition Permit.
- B. All hazardous materials and wastes used in or generated by this Work, including but not limited to paint chips and dust, concrete slurries, petroleum products, and solvents, shall be collected and disposed of in accordance with all applicable regulations.
- C. All electrical items to be demolished shall be disconnected and terminated as described in the electrical and/or controls specifications.

- D. Pipe and vault abandonment is described on the Plans and in Section 02 41 00.
- E. Demolition, loading, hauling and disposal of debris shall be performed legally without impact to property or rights-of-way. No materials shall be burned nor allowed to remain on the ground. No materials shall be allowed to enter waters, storm drains, or sewers. Contractor shall use all reasonable measures to contain and control debris generated by and during demolition, hauling, and disposal.

*****END OF SECTION*****

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Work includes but is not limited to the following:
 - 1. All material, labor, and equipment to prepare subgrade, build forms, and place concrete for concrete driveway, panel enclosure pad, saddle manhole base, and for related work shown on the Plans. Compensation for all costs associated with cast-in-place concrete shall be incidental to the lump sum bid item(s) in which the work is identified.
 - 2. Work related to the new concrete water reservoirs and foundations is covered in Section 33 16 33 Water Storage Tank.

1.02 RELATED SECTIONS

- A. Coordinate related work specified in other parts of the Project Manual, including but not limited to following:
 - 1. Section 31 20 00 Earth Moving
 - 2. Section 31 50 00 Excavation Support and Protection
 - 3. Section 33 05 00 Common Works Results for Utilities
 - 4. Section 33 16 33 Water Storage Tank

1.03 REFERENCES

- A. Comply with the requirements of Section 01 41 00 REGULATORY REQUIREMENTS, and as listed herein.
- B. Comply with the following references (C – G). Where conflicts may arise, comply with the more stringent requirements.
- C. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, Latest Edition.
- D. Washington State Department of Ecology Stormwater Management Manual for Western Washington, latest edition
- E. American Concrete Institute (ACI) ACI-318-11, Building Code Requirements for Structural Concrete.
- F. ACI 117-10 Specification for Tolerances for Concrete Construction.
- G. Concrete Reinforcing Steel Institute (CRSI), Manual of Standard Practice, 28th Edition.

1.04 SUBMITTALS

- A. Product Data: Required for each material and product to be incorporated into the Work.
- B. Samples: Submit samples of materials as specified and as otherwise requested by Engineer, including names, sources and descriptions.
- C. Laboratory Test Reports: Required for concrete materials and mix design.
- D. Material Certificates: Signed by manufacturer and Contractor; Submit in lieu of laboratory test reports as acceptable to Engineer, demonstrate compliance with requirements.

1. Certification of admixtures compatibility by Contractor's approved technician.
- E. Mix Design: Written proposal for each concrete mix and strength required submit 15 days prior to start of Work. The mix design shall list the following
 1. All materials and admixtures and their proportions.
 2. Water-cement ratio, slump, and aggregate grading.
 3. Evidence that mix design meets the strength requirements: Compression test data (field experience method) or results of testing (trial batch method) used to establish mix proportions.
 4. Indicate materials sources for principal constituents.
 5. Whether the mix is appropriate for pumping.
 6. Evidence of ability of mix to meet requirements for limited shrinkage.
- F. Submit schedule of concrete placement operations before commencing Work, show on one or more plans or elevations, locations of construction, contraction and expansion joints.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: See referenced Codes, ordinances and the like as well as Section 01 44 00 QUALITY ASSURANCE/QUALITY CONTROL.
- B. Testing and Inspection. Owner will provide independent testing and inspection outside of the contract. Contractor shall coordinate and cooperate with Owner's independent testing and inspection agency which will perform the following tasks:
 1. Compaction and Moisture Control Tests on foundation subgrade prior to placement reinforcing, if required.
 2. Reinforcing placement, lap length, and bar sizes, if required. Concrete placement.

1.06 PROJECT SITE CONDITIONS

- A. Coordination: Notify the Engineer upon completion of subgrade preparation work, completion of base course, and also of intended schedule for placement.
- B. Establish and maintain required lines and elevations.
- C. Follow ACI 318 requirements for hot and cold weather work. Protect concrete with curing blankets for a minimum of 72 hours when temperatures are expected to be below 38 degrees F for more than 3 hours. When temperatures are expected to be above 85 degrees F for more than 12 hours, use curing compound or continuous wetting techniques to reduce cracking. The Owner shall have authority to require such protections based on National Weather Service hourly forecasts.

PART 2. PRODUCTS

2.01 GENERAL

- A. Comply with "Quality Assurance" provisions, "References," and Specifications. Where these may be in conflict, the more stringent requirements govern.

2.02 CAST-IN-PLACE CONCRETE MATERIALS

- A. Concrete: Mix design shall be in accordance with the Plans and WSDOT Standard Specifications.
- B. Reinforcing steel shall be in accordance with the Plans and WSDOT Standard Specifications, if required.
- C. Joint Sealant. Joint Sealant shall be GREY IN COLOR approximating matching color of concrete and meet WSDOT Standard Specification 9-04.2.
- D. Premolded Joint Filler for Expansion Joints. Pro-Flex manufactured by Oscoda, or approved; 100 percent recycled vinyl.
- E. Adhesive Doweling Accessories, if required –
 - 1. Accepted products include:
 - a. ITW-Ramset Epcon system with “Ceramic 6” polymer adhesive
 - b. Hilti HVA adhesive anchor system with HEA adhesive capsule
 - c. Hilti HAS threaded rods in Hilti C-100 adhesive
 - 2. Adhesive dowels shall have minimum embedment of 12 bolt diameters, unless noted otherwise on drawings. The hole diameter and roughness shall be per manufacturer’s instructions; thoroughly clean hole before installation.

2.03 CEMENT GROUTS

- A. Shall be in accordance with LWUSD Standard Detail S1, and as shown on the Plans.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 CAST-IN-PLACE CONCRETE - INSTALLATION

- A. Install in accordance with “Quality Assurance” provisions, “References,” Specifications, and Manufacturer’s directions. Where these may be in conflict, the more stringent requirements govern.
- B. Bar detailing, if required, not shown otherwise on drawings shall comply with the CRSI Manual of Standard Practice.
- C. Forms, if required, shall be constructed of well fitted and leak-proof materials so that fins or voids are not created in the finished work.
- D. Lap all bars, if required, 40 diameters unless shown otherwise on the drawings. Bars parallel to the line of the wall shall be continuous, i.e. lapped or with corner “L” bar laps, or otherwise terminated at the ends of the wall with 6” x 90 degree hooks.
- E. Support reinforcing bars, if required, on chairs or other purpose-made devices so that they are securely held in place and maintain tolerances during placement and consolidation of concrete.
- F. All work associated with the manufacture, transport, and placement of concrete shall

comply with References listed in Section 1.4 of this specification section.

G. Finishing Concrete:

1. General: Vibrate to compact, screed, level, and tamp with a grid tamper to raise a thin mortar bed to the surface. Trowel after concrete has hardened sufficiently to prevent drawing moisture to the surface. Do not dust with dry materials.
2. Sidewalks, Exterior Slabs on Grade and Curbs: Steel trowel and medium broom finish.

H. Curing Concrete:

1. All structural concrete shall be moist cured for a minimum of 7 days, unless otherwise instructed by Engineer.

I. Tolerances: match adjacent concrete within 1/8 inch.

*****END OF SECTION*****

SECTION 05 50 00 – METAL FABRICATIONS

GENERAL

1.01 DESCRIPTION

- A. Work consists of furnishing labor, materials and equipment for the fabrication and erection of metal fabrications including Water Reservoir appurtenances, pipe supports, and other miscellaneous items. The Section includes embedded and nonembedded metal work, aluminum shapes, clip angles, rungs, tubing, rods guides, inserts, brackets, anchor bolts, beams, bracing, and similar items.
- B. Coordinate requirements with the water storage tank/reservoir details and structural details in the Project Plans.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM).
 - 1. A 36 - "Specification for Structural Steel."
 - 2. A 153 - "Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware."
 - 3. A 307 - "Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile."
 - 4. B 6 - "Specification for Zinc (Slab Zinc)."
- B. American Welding Society (AWS).
 - 1. D1.1 - "Structural Welding Code."

1.03 SUBMITTALS

- A. Shop Drawings for all fabricated items including all connections, field joints, and finishes.
- B. Welder's licenses.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Metal Fabrications: Meet applicable requirements of UBC Chapter 27.

PRODUCTS

2.01 MATERIALS

- A. Steel and iron
 - 1. Carbon steel shapes, plates and bars: A 36.
 - 2. Steel pipe: ASTM A 53, Schedule 40 unless indicated otherwise.
 - 3. Steel tubing: Square or rectangular: ASTM A 500 Grade B, welded and seamless.
 - 4. Steel sheet: ASTM A 366 if not galvanized, ASTM A 526 if galvanized.

- B. Stainless steel: ASTM A 167 Type 304 and Type 316.
- C. Galvanizing
 - 1. Where items are called to be galvanized, galvanize by the hot-dip process in conformance with ASTM A 123, A 153, and A 525. Two ounces/square foot minimum.

2.02 FASTENERS

- A. Metal to metal:
 - 1. Steel to steel: ASTM A 307, Grade A, hex head, galvanized unless neither steel item is galvanized.
 - 2. Other: Stainless steel; ASTM F 593, Type 304.
- B. Metal to concrete:
 - 1. No Mechanical Anchors allowed except where specifically called out.
 - 2. Adhesive/Chemical Anchors
 - a. Post-installed adhesive anchor bolts shall be of steel conforming to the requirements of the applicable ICC-ES report for the adhesive system. Make and clean holes with equipment per the ICC-ES report. Do not place any anchor within 3-1/2 inches of a free edge of concrete. Embedment per adhesive system recommendations and in coordination with the structure limitations.
 - b. Accepted adhesive products include:
 - (i) ITW-Ramset Company: Epcon G5 System
 - (ii) Hilti Inc: Re-500 SD System
 - (iii) Simpson Strong-Tie Company: Set-XP Epoxy
 - (iv) Other systems with written approval of the engineer of record.
 - (v) Note that for any product to be accepted, it must have a currently valid ICC-ES report with test results indicating that it is suitable for use in cracked concrete.
 - c. Adhesive anchor bolts shall have minimum embedment of 12 bolt diameters, unless noted otherwise. Hole diameter per manufacturer's instructions; thoroughly clean hole before installation, using a compressed air source without oil in the air.
- C. Cast-in-place anchor bolts set in concrete or masonry shall conform to ASTM Grade 55, and shall include a threaded steel rod with a standard nut and washer at the embedded end.
- D. Powder-actuated fasteners: May be used for all types of fastenings where pullout and shear values will not exceed 40% of manufacturer's specified values; galvanized for steel; stainless steel for all other.
- E. Washers: Provide washers of the same material and finish as the bolt or lag bolt in the following locations:
 - 1. Under all nuts.

2. Under bolt heads where bolt material has a yield stress more than 110% of the yield stress of the material being fastened.
- F. Lock washers: Provide spring steel helical lock washers of the same finish as the bolt under nuts and bolt heads of connections subject to vibration.
- G. Nuts: Nuts shall conform to the recommendation of the applicable bolt specification and shall be of the same material as the bolt.

2.03 WELDING

- A. Perform welding in accordance with pertinent recommendations of the American Welding Society. Use electrodes and methods recommended by manufacturer of material being welded. Type, size and spacing of welds in accordance with reviewed Shop Drawings.
 1. Welding shall be done by operators who are State-licensed. The quality of welding shall conform to AWS "Code for Arc Welding in Building Construction," Section 4 Workmanship.
- B. Welds behind finished surfaces: Use methods to minimize distortion and discoloration of finished surface.
- C. Remove flux and slag from both sides of welds.
- D. Grind accessible welds smooth.
- E. Buff or polish welded surfaces which will be exposed to view in the finished work to match and blend with adjacent parent material.
- F. Complete welding before galvanizing, anodizing or painting.

2.04 GALVANIZING REPAIR PAINT

- A. High zinc dust content paint, Military Specification MIL-P-21035.

2.05 SHOP PRIMED SURFACES AND ASSEMBLIES

- A. Steel Surfaces
 1. Shop prime steel with primer for paint system as specified in Section 09 90 00 PAINTING, painting schedule for Service Condition A Epoxy.
 2. If metal surfaces are shop primed with a coating other than the one specified in Section 09 90 00, the Contractor shall submit in writing to the Engineer a statement that the primer is compatible with the required top coatings specified in Section 09 90 00. Should the entire coating system fail down to bare metal as a result of the shop primer, the Contractor shall be responsible for removal of existing coatings, and re-priming and re-painting at no additional cost to the Owner.

2.06 SURFACE TREATMENT - FIELD APPLIED

- A. Galvanized surfaces: Items that must be drilled or cut in the field as approved by Engineer shall be coated with galvanizing repair paint before installation.
- B. Painted surfaces: Touch-up damaged shop primed surfaces. Provide and apply field priming and finish painting as specified in Section 09 90 00, painting schedule.
- C. Field preparation and painting provided under Section 09 90 00.

2.07 CORROSION PROTECTION

- A. Ferrous metals that are not entirely embedded in concrete shall be hot-dip galvanized after fabrication. Other miscellaneous steel items not specifically described elsewhere shall be hot-dip galvanized.

2.08 FABRICATION, GENERAL

- A. Verify dimensions on site prior to shop fabrication.
- B. Fabricate items with joints neatly fitted and properly secured.
- C. Fit and shop assemble in largest practical sections, for delivery to site.
- D. Exposed mechanical fastenings: Flush countersunk screws or bolts unobtrusively located consistent with design of structure, except where specifically noted otherwise.
- E. Make exposed joints flush butt type hair line joints where mechanically fastened.
- F. Supply components required for proper anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication.
- G. Clean surfaces of rust, scale, grease and foreign matter prior to prime painting, galvanizing, anodizing or buffing.
- H. Galvanize or prime paint steel items as scheduled. Do not shop prime surfaces to be embedded in concrete. Primer is part of paint system specified in Section 09 90 00. Conform with ASTM A 123 and A 153 as applicable. Provide minimum 2.00 ounce/square foot galvanized coating except as otherwise specified therein.
- I. Shop primers that do not contain rust-inhibitive agents are not acceptable.

EXECUTION

3.01 INSPECTION

- A. Installer must examine the areas and conditions under which miscellaneous metal items are to be installed and notify the Contractor in writing of conditions detrimental to the timely and proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner satisfactory to the installer.

3.02 PREPARATION

- A. Furnish setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors which are to be embedded in concrete or masonry. Coordinate delivery of such items to project site.

3.03 ERECTION

- A. Obtain Engineer's written permission prior to site cutting, welding, or making adjustments which are not part of scheduled work.
- B. Install items square and level, accurately fitted and free from distortion or defects.
- C. Make provision for erection stresses by temporary bracing. Keep work in alignment.
- D. Replace items damaged in course of installation.

- E. Grouting (see Section 03 30 00 Cast-in-Place and Section 33 05 63 Precast Concrete Utility Structures):
 - 1. Grout anchor bolts and other items subject to pullout with epoxy grout.
 - 2. Use non-shrink grout for other grouting.
- F. After installation, touch up scratched and damaged prime painted and galvanized surfaces.
 - 1. Use same primer as used for shop priming of painted surfaces.
 - 2. Use galvanizing repair paint for galvanized surfaces.

3.04 PROTECTION OF STAINLESS STEEL

- A. Stainless steel modifications/fabrication shall not be performed on-site unless Contractor obtains prior approval from Engineer.

*****END OF SECTION*****

SECTION 09 90 00 - PAINTING

PART 1. GENERAL

1.01 DESCRIPTION

- A. Description of System: The work covered by this section consists of furnishing all labor, equipment and materials necessary for the preparation and application of the paint coatings as specified herein.

1.02 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Comply with the requirements of agencies having jurisdiction over this section of work, including, but not limited to:
 - 1. WISHA, Washington Industrial Safety and Health Act.
- B. Reference Standards: All surface preparation, coating and painting shall conform to the applicable requirements of the:
 - 1. National Association of Corrosion Engineers
 - 2. Steel and Structures Painting Manual, Volume 2, Systems and Specifications (latest revision) published by the Steel Structures Painting Council (SSPC).
- C. Manufacturer: Manufacturer shall be of established good reputation and shall have regularly engaged in the manufacture of such coatings for a minimum of 5 years. This experience shall include a minimum of 20 similar applications in which such coatings have proven satisfactory service for a minimum of 3 years.
- D. Contractor: Contractor shall have 5 years of practical experience and successful history in the application of paint coatings to surfaces of municipal or industrial type equipment.
- E. Paint Film Thickness: All painted surfaces will be inspected by the Contractor with approved wet-film thickness gages. Inspection will include the thickness measurement of each prime and finish coat.
- F. Manufacturer's Representative: The manufacturer shall provide a qualified representative to visit the site from time to time during the paint operations as requested by the Engineer. The manufacturer's representative shall assist the Engineer in monitoring surface preparation and paint application.

1.03 SUBMITTALS

- A. Submittals detailing product data and application procedures shall be submitted for each paint service condition.
- B. Color charts for each of the finish coats listed in Part II of this section shall be submitted at least thirty (30) days prior to the starting of painting.
- C. A Schedule of the Painting Work shall be submitted to the Engineer at least fourteen (14) days prior to commencing of any work under this section. A revised schedule shall be submitted as requested by the Engineer to reflect changes or delays in the work.

1.04 JOB CONDITIONS

- A. Environmental:
 - 1. Protective coatings shall not be applied in areas where dust is being generated or in any other areas where disturbances will affect the quality of the work.

2. The Contractor shall comply with the manufacturer's recommendations as to environmental conditions (i.e. temperature, moisture, exposure to sunlight etc.) under which coatings and coating systems must be applied and cured.
- B. Protection: The Contractor shall be responsible for protecting coatings or coating systems from any disturbances during or after application which will affect the quality of the work.

1.05 DELIVERY AND STORAGE

- A. Delivery: All products shall be delivered in sealed containers with labels legible and intact. Labels shall include the following information: Manufacturer's name and stock number, type of paint or protective coating, color, instructions for reducing, label analysis, and federal specification number.
- B. Storage: Products shall be stored in a single location and in a manner complying with all applicable safety, health and fire regulations.

PART 2. PRODUCTS

2.01 GENERAL

- A. Surfaces to receive insulation or other protective materials shall be coated or painted in conformance with the applicable Service Conditions as specified herein.

The intent has not been to identify each and every item to be coated, but only to list the major items. In no case shall any wood, ferrous metal or other surface, requiring protection, be left uncoated or unpainted.
- B. The products specified are those which have been evaluated for the specific service and are given to establish a quality standard for that service. Products of other manufacturers comparable in quality and type to those specified will be acceptable if said paints are offered by the Contractor with satisfactory data on past performance in similar applications. Requests for substitutions shall be in accordance with the Standard Specifications.
- C. The Contractor shall use products of the same manufacturer for all prime and finish coats listed in each separate Service Condition.
- D. Colors to be used shall be as designated by the Owner based upon the color charts provided by the Contractor.
- E. For the paint thickness listed under each Service Condition:
 1. WT = wet-film thickness in mils
 2. DF = dry-film thickness in mils
 3. The number following equals the minimum film thickness required, per coat.
 4. Putty: Conform to FS TT-P-791A(3), colored to match paint and stain finishes, as applicable.
- F. Cementitious Filler: Non-shrink formulation, white Portland cement with fine silicate aggregate, zinc-oxide pigment, and reinforcing chemical binder as approved.
- G. Unspecified materials such as turpentine, linseed oil, or mineral spirits shall be products of reputable manufacturers and as recommended by paint manufacturers.
- H. Materials for Undercoats and Finish Coats: Ready mixed, and shall not be changed,

except thinning of undercoats (when required), reinforcing, or coloring, all of which shall be performed in accordance with manufacturers' recommendations.

1. SERVICE CONDITION A

a. Generic Type: Epoxy

b. Applications:

All exposed metal piping (including exposed ductile iron piping), joints, fittings, valves, supports, bollards, yard hydrant accessories, runway beams, runway supports, fasteners, and misc. ferrous metal items for this project shall be painted. Copper, galvanized, aluminum, and stainless steel metal surfaces shall not be painted unless specifically specified. Exposed piping shall be defined as all piping that is not backfilled, permanently or intermittently submerged. Exposed piping in vaults is considered to be exposed and shall be painted. All bollards are to be completely protected with shop coatings (primer and finish).

c. Primer:

One coat Tnemec Series 161- "High Solids Epoxy".

DF = 4.0 to 6.0

d. Finish:

One coat Tnemec Series 161- "High Solids Epoxy".

DF = 4.0 to 6.0

2. SERVICE CONDITION B

a. Generic Type: Galvanizing Repair Paint

b. Applications:

Repairing HDG surfaces that are marred, or must be drilled or cut in the field as approved by the Engineer shall be coated with galvanizing repair paint before installation.

c. Material: High zinc dust content paint, Military Specification MIL-P-21035. Installed per manufacturer recommendations.

PART 3. EXECUTION

3.01 GENERAL

- A. All work shall be performed by skilled craftsmen qualified to perform the required work in a manner comparable with the best standards of practice. The intent of the coating systems is to obtain smooth, clean, dry and well protected surfaces.
- B. All coating and painting shall conform to applicable standards of the National Association of Corrosion Engineers and the Steel Structures Painting Council Manual. Material applied prior to approval of surface by the Engineer shall be removed and reapplied at the expense of the Contractor to the satisfactions of the Engineer.
- C. Dust, dirt, oil, grease or any foreign matter that will affect the adhesion or durability of the finish must be removed by washing with clean rags dipped in a grease solvent and wiped with clean dry rags. Slag and weld metal accumulation and spatters shall be removed by chipping and grinding. All sharp edges shall be peened, ground or otherwise blunted as required by the Engineer.

- D. Painting systems include surface preparations, prime coatings and finish coatings. Unless otherwise specified, prime coat-coatings shall be field applied. Where prime coatings are shop applied, they shall be thoroughly cleaned and touched up in the field as specified. Any off site work which does not conform to this specification is subject to rejection by the Engineer.
- E. The Contractor's coating and painting equipment shall be designed for the application of the materials specified and shall be maintained in first class working order. The Contractor's equipment shall be subject to approval of the Engineer.
- F. Application of the first coat shall follow immediately after surface preparation and cleaning and within an eight-hour working day. Any cleaned areas not receiving first coat within an eight-hour period shall be re-cleaned prior to application of first coat.
- G. Prior to assembly, all surfaces that are inaccessible after assembly, shall be prepared as specified herein and shall receive the paint or coating system specified.
- H. Drop cloths shall be used to protect floor and adjoining work from splatter. Any paint surface damaged shall be repaired to the satisfaction of the Engineer before the work will be accepted. The lines formed by changes in color of coatings shall be neat and straight.

3.02 SURFACE PREPARATION

- A. General:
 - 1. All surfaces to be painted shall be prepared in a workmanlike manner with the objective of obtaining a clean and dry surface. Surfaces shall be cleaned of all oil, rust, grease, dust, scale, and other foreign substances that may inhibit bonding.
 - 2. Field blast cleaning for all surfaces shall be dry blasted unless otherwise directed. Maximum particle size of abrasives shall be that which will produce a profile in accordance with recommendations of the coating manufacturer.
- B. All interior and exterior welded and abraded steel shall be sandblast cleaned in conformance with SSPC Section SP10 (Near White Blast Cleaning).
- C. Shop-Primed Ferrous Metal: Contractor shall be responsible for compatibility of the applied shop primer and the proposed field primer. If primers are compatible, all surfaces shall be cleaned in conformance with the manufacturer's data sheet. If shop primer is not compatible, or damage to shop applied primer is too extensive for field touch-up, the surfaces shall be sandblasted in conformance to the surface preparation used in the shop.
- D. Shop Finished Ferrous Metal: Factory finished equipment or materials which have suffered damage to the shop applied coatings during shipment or installation shall be roughed-up in the field. All surfaces shall be cleaned in conformance with SSPC Section SP2 and touch-up shall be performed with paint supplied by the manufacturer.
- E. Immersion Service Ferrous Metal: Surfaces shall be sandblasted to a "Near White Clean" SP10 before application of the primer.
- F. Non-Ferrous Metal: Surfaces to be painted shall be cleaned in conformance with SSPC Section SP1 (Solvent Cleaned).
- G. Galvanized Metals: Galvanized surfaces to be painted shall be cleaned in conformance with SSPC Section SP1. Before application of the primer, surfaces shall be treated with one coat Koppers 40 Passivator (WF=4.0, DF=0.4).
- H. Pipe with Factory Applied Bituminous Coatings: All exposed ductile iron pipe shall be

painted. Bituminous coating shall be removed by sand blasting to near white before application of primer.

3.03 COATING SYSTEMS APPLICATION

- A. All coatings shall be applied in strict accordance with the manufacturer's printed instructions and recommendations.
- B. All coatings shall conform to the film thicknesses as specified in Part 2 of this section. Coatings failing to meet the minimum dry film thickness shall be given additional coats until the minimum film thickness is attained.
- C. Undercoats shall be tinted similar to the finish coats. Each coat shall be slightly darker than the preceding coat.
- D. Each coat applied shall be inspected and approved by the Engineer before application of the succeeding coat.
- E. Allow each coat to dry thoroughly before applying the next coat.
- F. Finish coats shall be uniform in color and sheen without streaks, laps, runs, sags or missed areas.

3.04 CONTRACT CLOSE-OUT

- A. The Engineer shall make a detailed inspection of the paint work upon completion. All damage to surfaces resulting from the work of this section shall be cleaned, repaired or refinished as necessary, at no cost to the Owner.
- B. Upon completion of the work, all paint equipment and materials shall be removed from the site. Coating or paint spots, oil or stains upon adjacent surfaces shall be removed and the job site cleaned.

3.05 COLOR REQUIREMENTS

- A. All exposed piping (except stainless steel and galvanized steel) is to be painted. Piping color charts are to be submitted for Owner review. Piping to be painted per the following color scheme:

EXPOSED PIPE COLOR REQUIREMENTS	
Water	Blue
Tank Overflow/Drain	White

*****END OF SECTION*****

SECTION 26 00 00 – CERTIFICATION PAGE

SECTION 26 00 00 – CERTIFICATION PAGE

Electrical Engineer Professional Certification: I hereby certify that Division 26 of this Specification were prepared by me or under my direct supervision and that I am a duly registered Engineer in the State of Washington. My stamp applies to the sections below:

DIVISION - 26 ELECTRICAL

26 00 10 Basic Electrical Requirements
26 05 00 Common Work Results
26 05 26 Grounding
26 07 00 Thermal and Moisture Protection
26 20 00 Electrical Transmission & Devices
26 50 00 Lighting



K Engineers, Inc.
208 Third Street
Lynden, WA 98264
Phone: 360-354-4757

End of Section 26 00 00

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01. APPLICABLE PROVISIONS

- A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

- A. The requirements of this Section and the other Division 26 Sections apply to all the electrical work.
- B. Coordinate electrical work with related work shown and specified elsewhere.
- C. Work Included: The Contractor shall perform all the Work required (including the furnishing of all supervision, labor, services, tools, materials and equipment and the performance of all operations and incidentals necessary) for a complete, safe and reliable electrical installation, adjusted, tested and ready for operation. The electrical work is generally described as follows:
 - 1. Scheduling and coordination.
 - 2. Electric service to point of connection with Puget Sound Energy Co. (including all necessary coordination with the utility).
 - 3. Locating of existing underground objects; including power, telephone, cable television, water, sewer, natural gas, etc. (owner and utility owned).
 - 4. Power (normal and standby) distribution system including meter base, feeders, circuit breakers, panelboards, disconnects, etc.
 - 5. Grounding.
 - 6. Wiring devices.
 - 7. Lighting fixtures.
 - 8. Lighting controls and devices.
 - 9. Branch circuit wiring system for lighting, outlets, equipment, controls, hazardous locations, etc.
 - 10. Electrical Enclosure, Control Panel, control devices, integration with reservoir systems.
 - 11. Process Control and Instrumentation Systems (PCIS), Control Panel, telemetry hardware, temporary connections, including modification of existing. The bidder will need to specify who the PCIS contractor is on the Bid Form.
 - 12. Control and instrumentation circuit wiring system for pumps control and monitoring.

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

13. Security devices, intrusion door contacts and vault limit switches.
 14. Ancillary systems raceways, boxes, etc.
 15. Supports.
 16. Pull strings and ropes.
 17. Trenching and backfilling for underground electrical work.
 18. Cutting and patching, core drilling, etc.
 19. Moisture, fire and dust stopping and sealing.
 20. Temporary construction power.
 21. Testing and completing.
 22. Final cleaning.
 23. Obtaining and paying for all required licenses, permits, inspections, plan review fees and any other fees.
- D. Work not included: The following electrical system related work will be provided by the Owner, General Contractor or other Subcontractors:
1. Owner: Payment of utility service charges.
 2. Owner: Programing and Integration of Control Panel into existing owner SCADA system.

1.03. EXISTING CONDITIONS

- A. Before submitting bid, examine existing site conditions to determine effect on execution of the electrical work and include costs in bid.
- B. Existing devices, circuits, conduit, wiring, etc. indicated on the plan are based on site verification and are shown for diagrammatic purposed only. The contractor shall expect that an extensive amount of circuit tracing to determine how the actual circuits are installed will be required.
- C. Underground utilities (electrical, water, sewer, cable television, etc.) are known to exist in the area of construction. The location of existing utilities shown on the drawings is approximate only and is not guaranteed to be an indication of all utilities in the area. The contractor is responsible for contacting the Owner and all utility companies and for field location of all utilities prior to construction. The one-call number for underground utility location services is 811 (1-800-424-5555). The Contractor shall promptly notify the Engineer of any conflicts between the contract documents and field location of existing utilities. The Contractor is responsible for maintaining the integrity of all existing utilities during construction.

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

- D. Damaged electrical and telecommunications (telephone, computer/data, television, fiber, copper, etc.) cables shall be replaced in their entirety. Splicing will not be allowed.
- E. Restore site soils and plantings in trenching and backfilling areas and extend site restoration into adjoining areas to remain in a manner that eliminates evidence of trenching and backfilling.

1.04. PERMITS

- A. The Contractor shall arrange for inspections and pay for all required licenses, permits, inspections, and any other fees.

1.05. DEFINITIONS

- A. The term "Contractor" used throughout Division 26 of these specifications and on the electrical drawings shall be understood to mean the Electrical Contractor. All other work shall be called out by name.
- B. "Approved" means approved by the Engineer. "For approval" means for the Engineer's approval.
- C. "Furnish" means to supply and deliver to the Project, ready for installation and in operable condition.
- D. "Install" means to incorporate in the work in final position, complete, anchored, connected, and in operable condition.
- E. "Provide" means furnish and install.
- F. "As directed" means as directed by the Engineer.
- G. "Concealed" means hidden from sight in trenches, walls, chases, ceilings, etc.
- H. "Exposed" means within sight; that is, not concealed as defined above, and installed on the surface of walls, ceilings, etc.
- I. "C.O." means conduit only; that is, without cable (except, provide pull string or rope).
- J. "F.O.I.C." means Furnished by Others (e.g. general contractor, other subcontractors, equipment suppliers, Owner, etc.), Installed by Electrical Contractor.
- K. Definitions of all other terms, etc. are in accordance with AIA, ANSI, IEEE, IES, NEMA, etc. standard definitions.

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

1.06. DRAWINGS & SPECIFICATIONS

- A. The electrical plan drawings are general in form and do not attempt to show complete details or list every item of the electrical systems, the building construction or the various equipment; however, the routing of raceways and circuits, and the locations of equipment, devices, fixtures, etc. represent the desired finished arrangement; except, as governed by structural or mechanical conditions or obstructions.
- B. Specifications are, in some cases, written in an abbreviated form. Words such as shall, shall be, the Contractor shall, and similar mandatory phrases are supplied by inference.
- C. Investigate the structural and finish conditions affecting the work. Refer to the civil, structural and mechanical drawings, supplier shop drawings and submittals, etc. for additional details, equipment ratings, dimensions, location and swing of doors, location and size of partitions, cabinets, etc. and similar features. Verify all dimensions, equipment ratings, etc. with the actual before installation. Arrange the work accordingly.
- D. The intent of the drawings and specifications is to include all items necessary for the proper execution and completion of the Work; however, any item or detail not specifically mentioned in the specifications or shown on the drawings, but which is necessary to produce the intended results shall be included.
- E. The Contractor shall bring to the Engineer's attention any discrepancies, inconsistencies, conflicts, errors, or omissions within the Contract Documents, between the Contract Documents and field conditions, and any design and layout changes required due to specific equipment selection, etc. prior to equipment and material purchasing and installation. If Contractor purchases any equipment or materials and performs any construction activity, and it knows or reasonably should have known that the documents contain a discrepancy, inconsistency, conflict, error or omissions, corrective work shall be at the Contractor's expense.
- F. In the event that there are discrepancies between requirements shown on different sheets of the drawings or between the drawings and the specifications, the more restrictive of the requirements shall apply.
- G. Verify all equipment and device locations with the Owner and Engineer prior to rough-in
- H. Verify exposed conduit routing with the Owner and Engineer prior to rough-in.

1.07. SUBMITTALS

- A. Submittals from the electrical contractor and each sub-contractor shall include a cover page indicating the company name, project manager name, and contact information for the contractor.
- B. Forward all submittals to the Engineer, together in a complete package, at one time, in electronic format as single .pdf files for each specification section. Submittals for individual products or incomplete submittals are not acceptable and will be returned without review.

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

- C. Submittals shall be grouped by specification section and shall be arranged in the same order in which they are found in the specifications to facilitate the review process.
- D. Re-submittals, when requested, shall be provided as complete and comprehensive for each specification section. Re-submittals for individual products or incomplete re-submittals are not acceptable and will be returned without review.
- E. Provide submittals for the equipment, boxes, devices, fixtures, special raceways, systems and their components, etc. as directed in the various sections of the specifications.
- F. Prepare detail layout drawings to a larger scale than the contract drawings in areas where the work is of sufficient complexity to warrant additional detailing.
- G. Submittal drawings shall be on standard size sheets no larger than the contract drawings.
- H. Submit M.S.D.S. (Manufacturer's Safety Data Sheets) for all chemicals or hazardous materials. All chemicals and hazardous materials to meet NIOSH Permissible Exposure Levels (P.E.L.) and OSHA Time Weighted Average (T.W.A.) requirements before commencing work.
- I. If requested by the Owner, provide samples of materials for evaluation.
- J. Submittals shall provide sufficient detail so compliance with the drawings and specifications can be ascertained. Clearly identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and review materials and equipment.
- K. Catalog pages containing more than one product shall be marked with arrows to indicate the proposed product.
- L. Obtain approval before purchasing any products. Items not in accordance with the drawings and specifications will be rejected.
- M. The Contractor shall establish quantities, check drawings and data, verify space requirements, dimensions, and possible interferences prior to submittal. Submittals which indicate quantities will not be reviewed by the Engineer for accuracy of quantity.
- N. The Engineer will review each submittal, mark to indicate action taken, and return. Compliance with specified characteristics is the Contractor's responsibility. Approval of submittals does not release the Contractor from a proper installation, compliance with the drawings, specifications, codes, standards, etc. or coordination of the work.
- O. Approval of submittals does not release the Contractor from a proper installation, compliance with the drawings, specifications, codes, standards, etc. or coordination of the work.
- P. Allow two weeks turnaround time for each submittal from the time of receipt at the engineer's office, except the engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until the related submittals are received.

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

1.08. SUBSTITUTE PRODUCTS APPROVAL

A. During Bidding:

1. Substitutions for equipment and materials other than that specified will be considered if equal (or better and/or higher) in quality, ratings and function; and similar in type, style, size and appearance.
2. Submit written requests to Owner and Engineer.
 - a. If received no later than 7 work days prior to Bid opening, requests will be considered, but not thereafter.
 - b. Bidders will be informed by Addendum of any approved items.
 - c. No responses will be provided for rejected items.
3. Requests shall be accompanied by complete specifications, samples, record or performance, certified tests by impartial, recognized laboratories, and other such information as required to clearly represent the proposed substitution.
4. Engine-generator set substitution requests shall include calculations to verify engine-generator set will start and run loads as listed in the panel schedules.
5. Final decisions as to quality and suitability of proposed substitutions rest solely with the Owner and Engineer and will be based on proof submitted.
6. The cost of changes required in order to incorporate the proposed substitution, such as revisions to controls, raceways, wiring, openings, appurtenances, etc., shall be included in the bid. Any cost reduction resulting from substitutions shall benefit the Owner through a reduced bid.
7. When Owner and Engineer approve a proposed substitution, it is with the understanding that Bidder certifies that substitute articles or materials are equal to or better than those specified and that no exception is taken with any of the performance objectives, service or warranty requirements or features herein specified.

B. After Bidding:

1. Substitute products requests will not be considered.

1.09. RECORD DOCUMENTS

- A. Submit record documents at completion of the project in accordance with the specific submittal requirements listed elsewhere in these documents.
- B. Provide “as-built” drawings in both full size reproducible form and in software form as AutoCAD .dwg type files.

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- C. All record documents in software form shall be provided on a single CD-ROM. Include the necessary program(s) to read test results. Separate submittals for the various disciplines will not be accepted.

1.10. "AS BUILT" DRAWINGS

- A. The Contractor shall continuously maintain a marked job set of as-built drawings as the work progresses, to indicate deviations from the original design, including change orders. Maintain records of all concealed wiring and of actual equipment, device, etc. locations. Provide dimensions from accepted reference lines as needed. The as-built drawings shall be kept on-site and available for inspection by the Owner.
- B. Include any detailed equipment, raceway, wiring, etc. diagrams and layouts prepared by Contractor or his subcontractors, suppliers, etc.
- C. At substantial completion, Contractor shall modify one complete set of reproducible copies, with all "as built" information and submit these drawings to the Owner for approval. Each sheet shall be marked "CORRECTED TO AS BUILT"; or, if there are no changes, drawings shall be marked "NO CHANGES, INSTALLATION PER PLAN".
- D. After approval, Contractor shall transfer all "as built" information from the marked job set and other information as appropriate to AutoCAD or AutoCAD LT .dwg type files. (Consultant/Engineer will provide construction drawings AutoCAD files to contractor.) Utilize the layering scheme, font types, line types, title block, etc. provided in the AutoCAD drawing files. All drawings shall be noted as "As-Built" with a stamp and date. After adding the "as-built" information, return the AutoCAD files to the Consultant/Engineer for inclusion into the final project record set.
- E. "As-built" drawings for all portions of the work shall be combined into a single set matching the contract documents. Separate submittals for the various disciplines will not be accepted.

1.11. OPERATION AND MAINTENANCE MANUALS

- A. Following installation of the electrical systems, but prior to acceptance of the work, Contractor shall submit to Engineer one loose-leaf volume with information systematically segregated and indexed for easy reference to be reviewed by the Owner and Engineer. This submittal copy will be returned to the Contractor, and the material can be used in preparation of final volumes. After approval of preliminary copy, but prior to project completion, submit 3 finished copies.
- B. Format shall be 8½" x 11" size with neat, clean copies, drawings (accordion folded), etc. Manuals shall have a typewritten index, and divider sheets with identification tabs between categories. Manuals shall be in hard cover 3 ring binders with titles permanently embossed on the cover face and the spine. The front of each volume shall be imprinted with the project name, title (e.g. "Electrical Equipment and Devices Operating Instructions and Maintenance Manual"), Owner, Electrical Engineer and Contractor.

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

C. Manuals shall include:

1. Record documents (see above); except, full size reproducible mylar copy of drawings to be provided separately.
2. Submittals, updated to "as built" conditions.
3. Test results; except, telecommunications equipment, cables, etc. test results shall be in a separate binder.
4. Description of systems configuration and operation including component identification and interrelations, including diagrams and supplementary drawings where necessary.
5. Installation, operation, maintenance and programming manuals covering the installed systems, equipment and materials.
6. Maintenance instructions (frequency of service, type of service, etc.).
7. Parts lists for all equipment; including recording information, recommended spares and anticipated useful life.
8. Supplier's names, addresses, telephone and reference order numbers for all equipment and materials.
9. Warranties and Bonds.
10. Copies of final inspection certificates from the authorities having jurisdiction.

D. Omit non-applicable data.

1.12. WARRANTY

- A. The complete installation shall be guaranteed for a period of one (1) year after date of project completion. For warranty purposes, the date of project completion shall be considered the date of final acceptance of the installation by the Owner certified in writing, and after Owner has received all project close-out requirements. All corrective work, if needed and requested by the Owner, shall be provided without cost to the Owner during the guarantee period.
- B. All corrective work performed by the Contractor in remedying defective work during the guarantee period following the Owner's acceptance of the project shall be subject to the same guarantee requirements of the original work for a period as specified from the date of completion of the corrective work.
- C. Corrective work shall include on-site service by the Contractor, subcontractor or supplier (e.g. control systems, etc.), and/or nearest technical service representative of the equipment manufacturer. Service shall be provided within 24 hours from the time of request for warranty service by the Owner.

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

1.13. TRAINING/INSTRUCTION AND ASSISTANCE

- A. After the installation is complete and operating, and prior to acceptance of the work, conduct a minimum of a one (1) hour training/instruction period at the site to point out locations of service and maintenance and instruct the Owner's in the operation of all systems and equipment.
- B. The person(s) who conduct these instructions and demonstrations shall be a qualified representative(s) of the manufacturer with substantial training and operating experience on this equipment and project, and shall be versed in the operating theory as well as practical operation and maintenance work. Instructor(s) shall have the necessary educational and interpersonal skills, as well as proven ability to effectively perform the training. Their qualifications shall be submitted to the Owner before conducting the instruction period.
- C. Each period shall include preliminary discussion and presentation of information using the actual maintenance manuals required for this project. Contractor shall notify Owner and Engineer at least 48 hours in advance of readiness to conduct the instruction period. The actual time and date of instruction period shall be acceptable to the Owner and Engineer.
- D. All training material shall be furnished and supplied by the Contractor.

1.14. QUALITY ASSURANCE

- A. Contractor and Contractor's personnel shall be experienced, thoroughly trained and completely familiar with the systems, equipment, devices, fixtures, materials, etc. and the required methods of installation.
- B. Contractor shall provide proof, upon request, that all personnel are licensed according to Washington State RCW.
- C. All materials, equipment and workmanship shall be properly inspected by the Contractor and shall at all times be subject to inspection by the Owner and Engineer. Contractor shall provide all samples, data and documents necessary for such inspection. Owner and Engineer shall be afforded full and free access at the jobsite and the shops and places of business of the Contractor for such inspection and to determine the status of the work. If Contractor covers all or any part of the work prior to any inspection or test specifically requested by Owner and/or Engineer, the cost of any necessary uncovering and replacing shall be borne by the Contractor.
- D. Neither the failure to make inspections or tests, nor to discover defective workmanship, materials or equipment, shall prejudice the rights of the Owner or Engineer thereafter to reject the work and/or require its correction.
- E. The completed installation shall comply with the more stringent of the requirements of the drawings and specifications, the authorities having jurisdiction, and all laws, ordinances, rules, regulations and requirements in effect at the site, including current editions of the following:
 - 1. NEC - National Electrical Code.
 - 2. National Electrical Safety Code.
 - 3. OSHA - Occupational Safety and Health Act (and its Washington State equivalent).

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4. ADA - Americans with Disabilities Act (and its Washington State equivalent).
 5. International Fire Code (and its Washington State equivalent).
 6. International Building Code (and its Washington State equivalent).
 7. Washington State Rules and Regulations for Installing Electrical Wires and Equipment (WAC 296-46).
 8. Washington State Safety Standards for Electrical Workers (WAC 296-45).
 9. Washington State Non-Residential Energy Code (NREC).
 10. Washington State “Excavation, Trenching and Shoring” law.
- F. The following standards establish the minimum requirements for the equipment and installation, unless exceeded by the requirements of the drawings or specifications:
1. ANSI - American National Standards Institute.
 2. BICSI – Building Industry Consulting Service International
 3. ICEA - Insulated Cable Engineers Association.
 4. IEEE - Institute of Electrical and Electronics Engineers.
 5. NEMA - National Electrical Manufacturers Association.
 6. NEIS – National Electrical Installation Standards
 7. NFPA - National Fire Protection Association.
 8. NECA – National Electrical Contractors Association
 9. EIA - Electronic Industries Association.
 10. TIA - Telecommunications Industry Association.
- G. In addition, telephone/voice & computer/data pathways & wiring shall be in accordance with the following:
1. ANSI/NECA/BICSI 568 – Installing Commercial Building Telecommunications Cabling.
 2. ANSI/TIA/EIA 526 – Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant
 3. TIA/EIA TSB-125 – Guidelines for Maintaining Optical Fiber Polarity Through Reverse-Pair Positioning.
 4. TIA/EIA TSB-140 – Additional Guidelines for Field-Testing Length, Loss and Polarity of Optical Fiber Cabling Systems.
 5. ANSI/TIA/EIA 568 – Generic Telecommunications Cabling for Customer Premises.
 6. ANSI/TIA/EIA 568 – Commercial Building Telecommunications Cabling Standard.
 7. ANSI/TIA/EIA 568 – Balanced Twisted Pair Telecommunications Cabling System Standard.
 8. ANSI/TIA/EIA 568 – Optical Fiber Telecommunications Cabling System Standard.
 9. ANSI/TIA/EIA 568 – Broadband Coaxial Cabling and Components Standard.
 10. ANSI/TIA/EIA 569 – Telecommunications Pathways and Spaces.
 11. ANSI/TIA/EIA 570 – Residential Telecommunications Cabling Standard.
 12. ANSI/TIA/EIA 598 – Optical Fiber Cable Color Coding.
 13. ANSI/TIA/EIA 606 – Administration Standard for Commercial Telecommunications Infrastructure.
 14. ANSI/TIA/EIA 607 – Commercial Building Grounding and Bonding Requirements for Telecommunications.
 15. ANSI/TIA/EIA 758 – Customer-Owned Outside Plant Telecommunications Cabling Standard.
 16. IEEE 802.3-2002 – IEEE Standard for Information Technology, Part 3: CSMA/CD.

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

- H. Nothing in the drawings or specifications shall be construed to direct or permit work not conforming to applicable laws, ordinances, rules, regulations, requirements or standards. Discrepancies or conflicts shall be brought to the attention of the Owner and Engineer promptly for resolution.
- I. The Owner and Engineer shall be advised whenever an inspection is requested. Any materials, equipment or workmanship that is not (in the opinion of the Owner, Engineer or Inspector) as it should be, shall be taken out and replaced without cost to the Owner.

PART 2 - PRODUCTS

2.01. GENERAL

- A. Coordinate the features of materials and equipment so they form an integrated system.
- B. Contractor shall make certain that all materials selected by him, his subcontractors or by his suppliers, conform exactly to requirements of the drawings and specifications. Transmittal of such specifications and drawing information to subcontractors, person manufacturing and/or supplying materials to the project, and rigid adherence thereto, is the Contractor's responsibility.
- C. All equipment, devices, fixtures, materials, etc. shall be UL (Underwriter's Laboratories, Inc.) listed, labeled and approved for the service intended where UL standards have been established. If no UL label is available, the label of a testing agency or conformance to national standards recognized and approved by the electrical inspector having jurisdiction is required.
- D. All equipment, devices, fixtures, materials, etc. shall be new and installed only if in first class condition.
- E. All equipment, devices, etc. and their components shall be designed for continuous duty without degradation of function or performance.
- F. In the event that any item is not available exactly as specified, the Contractor shall so notify the Owner and Engineer in writing prior to bidding as early as possible to allow ample time for an alternate item to be selected without delay to the project.

2.02. EQUIPMENT MANUFACTURERS

- A. Unless specifically noted otherwise, all references to manufacturer's or supplier's model numbers and other pertinent information herein is intended to establish minimum standards of performance, function and quality.
- B. All equipment, devices, materials, etc. shall be of a type manufactured by reputable recognized vendors. Each type or groups of items, system components, etc. having the same or similar function shall be the same manufacturer, make and quality throughout the facility.

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- C. Approval of a manufacturer's name and/or type does not release the Contractor of the responsibility for providing materials which comply in all details with requirements in the contract documents.

2.03. SPARE CAPACITY

- A. Unless sizes and/or quantities are specifically indicated, provide at least 20% spare wiring capacity in all cabinets, panels, cable trays and raceways.

2.04. ENCLOSURES

- A. Unless otherwise noted, equipment, devices, luminaires, boxes, etc. located indoors shall have general purpose (NEMA 1) enclosures, except:
- B. Equipment, devices, luminaires, boxes, etc. located outdoors shall be provided with weatherproof (NEMA 3R) enclosures. Surface finish shall be a rust inhibiting primer followed by an epoxy or polyurethane polyester top coat.
- C. Provide gaskets, seals, etc. as required to prevent the entrance of moisture, debris, insects, etc.
- D. Enclosures and boxes shall be fabricated from code gauge, or heavier, galvanized steel. Surface preparation and finish shall be manufacturer's standard unless noted otherwise.
- E. Include all necessary mounting, etc. accessories.

2.05. SUPPORT CHANNEL

- A. Channel, framing members, etc. shall be 12 gauge steel, galvanized, 1⁵/₈ inch channel width with all necessary accessories.
- B. Threaded rod shall be steel, minimum ³/₈ inch diameter.

2.06. ANCHORS AND FASTENERS

- A. Anchors and fasteners used shall be of a type designed for use in the base material to which the item is to be attached. Attach to wood with wood or lag screws, to metal with machine screws or bolts and to concrete with carbon steel wedge or sleeve type expansion anchors or self-drilling metal anchors and machine screws or bolts.
- B. Pad and floor mounted equipment shall be secured with suitable hot dipped galvanized steel anchor bolts, washers, hex nuts, etc.
- C. Powder actuated fasteners, plastic expansion type anchors, nails and toggle bolts are not permitted.
- D. Anchors shall be non-corrosive or have suitable corrosion resistant coatings or treatment.

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- E. Bolts, nuts, screws and other threaded devices shall have standard threads and heads, unless required for tamper-proof installation.

2.07. IDENTIFICATION

- A. Provide nameplates for all equipment (e.g. switchboards, panels, disconnecting means, control panels, control stations, etc.) and other devices used for the control of circuits, equipment, etc. Nameplates shall adequately describe the function or operation of the identified equipment, devices, etc. and include the panel and circuit number(s) from which it is fed. Nameplate designations shall be consistent with the project documents. Submit proposed inscriptions for approval.
- B. Provide nameplates for switchboards and panelboards to identify the system color coding scheme for phase and neutral conductors as required.
- C. Definite purpose devices shall be labeled with a description of the device's function, rating and include the panel and circuit number(s) from which it is fed.
- D. All equipment and outlets shall be labeled with the panel and circuit number(s) from which it is fed.
- E. Spare, C.O., etc. conduits shall be labeled with their destination.
- F. All non-underground medium voltage cables and conduits containing medium voltage cable shall be provided with suitable labels every 10 feet identifying the voltage of the cables and/or the cables within the conduits.
- G. Nameplates shall be laminated plastic, with lettering etched through the outer covering. Character size as appropriate for the application, approved by Engineer; ¼ inch minimum. Nameplates shall be securely fastened with suitable adhesive or self-tapping screws. Character and background colors shall conform to the following system color code:

<u>Background.</u>	<u>Char.</u>	<u>System</u>
Black	White	Power & Lighting
Orange	White	Emergency Systems
Red	White	Fire Alarm
Orange	White	Data Cabling & Equipment Systems*

* These are sub-systems of the general telecommunications distribution system. All cabling and equipment for the general telecommunications distribution system shall be identified with nameplates, etc. consistent with the data cabling and equipment systems (e.g. orange and white).

- H. Identification tags shall be plastic, flexible type with a label. Identification tags shall be securely fastened with cable ties. Tags shall be mounted so as to be clearly visible.
- I. Labels shall be heavy duty adhesive type, clear background with black letters on light colored devices and clear background with white letters on dark colored devices; except, labels on devices

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connected to the emergency power system shall have red letters. Lettering shall be appropriately sized for the application, ¼ inch minimum. Labels on ceiling mounted devices shall be large enough to read from the floor. Labels shall be as manufactured by Kroy, Brothers, or approved equal. Self-adhesive circuit numbers, masking tape, plastic punch type "Dymo" labels, etc. are not acceptable.

PART 3 - EXECUTION

3.01. CONSTRUCTION/WIRING METHODS

A. Wiring methods shall be as follows:

1. Service - PVC conduit below grade (with GRS conduit risers and RTRC fiberglass elbows) and GRS conduit above grade.
2. Feeders - PVC conduit below grade (with GRS conduit risers and RTRC fiberglass elbows) and EMT above grade for interior and GRS above grade for exterior.
3. Branch circuits - PVC conduit below grade (with GRS conduit risers and RTRC fiberglass elbows) and EMT above grade.
4. Telecommunications - PVC conduit below grade (with GRS conduit risers and RTRC fiberglass elbows) and EMT above grade.
5. Control, security, etc. - PVC conduit below grade (with GRS conduit risers and RTRC fiberglass elbows) and EMT above grade.

B. All wire and cable shall be enclosed within the raceway system.

C. Conduit and cable shall be run concealed in the walls (including within CMU and similar construction) or below the floor with all devices, etc. flush mounted unless specifically approved or noted otherwise. Exposed conduit (where allowed) shall be run as neatly and unobtrusively as possible, parallel or at right angles to walls, ceilings, etc. to the approval of the Owner and Engineer.

D. Devices shall be flush mounted unless noted otherwise.

E. Equipment shall be surface mounted unless noted otherwise.

3.02. CONTRACTOR CONTROL AND SUPERVISION

- A. Contractor shall supervise and direct the Work, using its best skill and attention, and shall perform the work in a skillful manner. Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the work, unless the Contract Documents give other specific instructions concerning these matters. Contractor shall disclose its means and methods of construction when requested by Owner.

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- B. Performance of the work shall be directly supervised by a competent superintendent (and/or foreman) who is satisfactory to Owner and has authority to act for Contractor. The superintendent (and/or foreman) shall constantly supervise the work and check all materials prior to installation for conformance with the Contract Documents. The superintendent (and/or foreman) shall not be changed without the prior written consent of Owner.
- C. Contractor shall enforce strict discipline and good order among Contractor's employees and other persons performing the Work. Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. Contractor's employees shall at all times conduct business in a manner which assures fair, equal, and nondiscriminatory treatment of all persons.
- D. Inappropriate activity or comments by Contractor, Contractor's employees and other persons performing the work will result in immediate removal from the site.

3.03. GENERAL

- A. The installation and demolition shall be done in a neat and workmanlike manner and shall be suitable for the location. Conduit stub-ups, sleeves and ends left open for future connection, unused hubs in fittings and unused holes in boxes shall be plugged or capped to prevent the entrance of moisture and debris.
- B. For the actual fabrication, installations, and testing, use only persons thoroughly trained, experienced and completely familiar with the items required and with the manufacturers' recommended methods of installation. In acceptance or rejection of the work, no allowance will be made for lack of skill or experience.
- C. The Contractor shall personally, or through a competent superintendent, constantly supervise the work and check all materials prior to installation for conformance with the Contract Documents.
- D. Circuits shall be run from equipment to equipment, outlet to outlet, fixture to fixture, device to device, etc. and all homeruns shall be run exactly as shown on the drawings unless permission is obtained from the Engineer to alter the arrangement.
- E. Changes in location (e.g. equipment and devices up to 10 feet, raceway routing, etc.) made before installation and deviations to avoid interferences shall be made without increase in Contract Sum.
- F. The Contractor shall conduct operations in a manner to avoid the risk of bodily harm to persons or damage to any property. Construction equipment and tools shall be in good operating condition and be designed to perform the work required. The Contractor shall continuously inspect all work to discover any unsafe conditions and be solely responsible for their correction.
- G. Use all means necessary to protect the equipment and materials and the work, materials, etc. of the other trades before, during and after installation. Do all cutting carefully to prevent damage to the work. Correct lifting, jacking and/or moving methods shall be used. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner and Engineer without increase in Contract Sum.

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- H. The Contractor shall provide all cutting, patching, core drilling, etc. as required for the work. Use only journeymen skilled in the necessary cutting or patching operation. Patching shall match adjacent work. Structural members shall not be cut without approval of the Engineer. Where penetrations in structural members for conduits, cables, etc. are allowed, the holes shall be no larger than absolutely necessary.
- I. The premises shall be kept free from the accumulation of rubbish and debris caused by the work.
- J. The Contractor shall provide all backboards, hangers, supports, chases, anchor bolts, inserts, sleeves and other openings in the construction required for the electrical work.
- K. Wall, ceiling and floor penetrations by raceways (both inside and outside the raceway), cables, etc. shall be sealed to maintain the original moisture, dust and fire resistance to the approval of the Engineer. Flash and counter-flash all roof penetrations.
- L. The Contractor shall move existing equipment, miscellaneous (office, storage, maintenance, etc.) objects and materials, and other building furnishings, attached or unattached, as required to perform the work, including returning the items to their original location in their original condition.

3.04. COORDINATION AND SCHEDULING

- A. The Contractor shall coordinate the work and cooperate with the Owner, other trades and System Contractors to have the work completed to the best advantage, insure there are no interferences, provide reasonable opportunity for the other trades and Contractors to complete their work and to not delay the work.
- B. The Contractor shall coordinate work to avoid disturbance to building operations and personnel, and to allow access for both persons to and within all portions of the facility and vehicles to the facility. Contractor shall coordinate and schedule with Owner a minimum of fourteen (14) days in advance and re-confirmed a minimum of 48 hours in advance, or as mutually agreed upon with Owner, to determine dates and times that access to the Contractor will be allowed.
- C. Any and all costs incurred for non-standard hours, double-shifts, overtime, etc. or any other costs associated with completing the project within the completion times required shall be included without increase in contract sum.
- D. The Contractor shall coordinate all phasing requirements with the Civil Engineer, General Contractor and Owner prior to performing the work. Contractor shall verify all demo work in each phase to ensure there are no interferences with the existing operations and functionality of the existing electrical, control, telemetry, etc. systems within the facility.

3.05. DELIVERY, STORAGE AND HANDLING

- A. All equipment and materials shall be stored neatly and out of the way. Conduit, fittings, cable, etc. shall be stored off the ground, protected from the weather in racks or bins or on shelves. Equipment,

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panelboards, fixtures, devices, etc. shall be stored indoors in a dry, warm area, free of dust and one in which condensation will not occur.

- B. Ship equipment in its original package to prevent damage or entrance of foreign matter. Perform all handling and shipping in accordance with manufacturer's recommendations and packing label instructions. Provide protective coverings during construction.
- C. Identify materials and equipment delivered to the site and storage organized to permit checking against approved material lists and submittals.

3.06. TEMPORARY POWER

- A. The Contractor shall provide all temporary power services, facilities, equipment, devices, material, etc. required for the construction; including adequate lighting, outlets, balancing, testing, etc. as may be necessary for the proper performance and inspection of the work.
- B. The temporary power system shall be provided in a neat and safe manner, in compliance with governing codes and good working practice.
- C. The temporary power system shall be removed when no longer required.

3.08. UTILITY SERVICES

- A. Electric service shall be in accordance with the requirements of Puget Sound Energy Co.
- B. The Contractor shall do all necessary coordination with the utilities, and do all excavating, trenching, backfilling, etc. as indicated and/or as required by the utilities to provide service to the facility (in accordance with their requirements).
- C. The Owner will pay utility service charges.

3.07. LOCATIONS

- A. Locations and mounting heights of equipment, devices, etc. shall be consistent, and in accordance with the requirements of NFPA, ADA and the authority having jurisdiction.
- B. Devices and associated wallplates shall be located so as to not span different types of building finishes.
- C. In general, surface raceways, cable trays, cable racks, etc. shall be mounted as unobtrusively as possible, tight against whiteboard trim, chair rails, in room corners, against ceilings, against chases, etc. and other breaks in the construction.
- D. Prior to rough-in, the Contractor shall mark or otherwise show the location of all equipment and devices, and the proposed routing of raceways. Obtain specific approval for the location of each from the Owner and Engineer before rough-in.

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- E. Changes in location (e.g. equipment and devices up to 10 feet, trench and conduit routing, etc.) made before installation and deviations to avoid interferences shall be made without increase in Contract Sum.

3.08. EQUIPMENT, LUMINAIRES AND DEVICES

- A. Equipment, luminaires, devices, etc. shall be installed plumb and true, and shall be square with the adjacent walls, ceilings, structural members and other equipment; in a horizontal or vertical position as intended. The location of similar items shall be consistent.
- B. Equipment, cabinets, boxes, fixtures, devices, etc. shall be accurately mounted and leveled and be firmly supported either directly or indirectly by a sound and safe structural member of the building in accordance with manufacturer's instructions, or as directed. Supports shall be neatly placed and properly fastened.
- C. The correct lifting, jacking and/or moving gear which will prevent damage shall be used.
- D. All bolts, nuts, screws and other fastenings shall be tightened in accordance with manufacturers or listing instructions and all covers replaced on equipment and boxes. All electrical connections, particularly those on bus work in panelboards, etc. shall be checked to ensure tightness and electrical conductivity.
- E. Follow manufacturer's installation and/or listing instructions and details where available. Provide all boxes, mountings, wiring or fittings required, standard or special.
- F. Provide gaskets, seals, etc. as required to prevent the entrance of moisture, debris, insects, etc. Check for proper fit.
- G. Repair damaged corrosion protection and touch-up paint all scratched, marred or damaged factory finish on equipment, devices, fixtures, enclosures, etc.

3.09. SUPPORTS

- A. Provide all necessary supports, anchors, fasteners, and backing for all raceways, racks, boxes, enclosures, luminaires and equipment.
- B. Hangers and supports shall be made from standard structural shapes and hardware or systems of shapes, fittings and hardware designed for the purpose.
- C. Hangers and supports shall be adequately and safely attached to the building structure. Equipment or materials to be supported shall be securely fastened to the supporting means. Use size and number of attachments as required for a safety factor of at least four. In addition to the weight of the material, consideration shall be given to the weight of the support itself, the weight of materials within, vibration, external operational forces, shock load, etc.

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- D. Brace all equipment, racks, etc. as required to meet the requirements of the International Building Code.
- E. Attach to wood with wood or lag screws, to metal with machine screws or bolts and to concrete with carbon steel wedge or sleeve type expansion anchors or self-drilling metal anchors and machine screws or bolts.
- F. Pad and floor mounted equipment shall be secured with suitable hot dipped galvanized steel anchor bolts, washers, hex nuts, etc.

3.10. CORROSION PROTECTION

- A. All material and equipment shall have corrosion protection suitable for the atmosphere in which they are installed.
- B. Maintain the integrity of factory provided corrosion protection. Repair damaged corrosion protection and touch-up paint all scratched, marred or damaged factory finish on equipment, devices, luminaires, enclosures, etc.; per manufacturer's instructions where available.
- C. Paint field cuts with a suitable cold galvanizing compound.

3.11. APPROVALS

- A. Prior to rough-in, the Contractor shall mark or otherwise show the location of all equipment and devices, and the proposed routing of raceways, cables, etc. Obtain specific approval for the location of each from the Owner and Engineer before rough-in.
- B. Prior to beginning installation of cables, obtain approval of the raceway installation from the Owner and Engineer.

3.12. CLEANING

- A. Remove trash, combustible material, and other debris from electrical rooms and areas around equipment.
- B. Remove shipping materials, supports, spacers, etc. from equipment, devices, etc.
- C. Remove all debris from equipment, devices, etc. including all scraps of wire, metal shavings, plaster, dust, and other foreign material.
- D. The top sides and interiors of all equipment and enclosures shall be vacuumed clean.
- E. The exterior of all equipment and enclosures shall be wiped down with a clean, dry, lint-free cloth or soft bristled brush.
- F. Clean screens, louvers, baffles, etc. covering ventilation openings to ensure they are clear.

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- G. Remove paint splatters and other spots, dirt, and debris.
- H. Touch up scratches to match original finish.
- I. Remove all traces of soil, dirt, dust, smudges, fingerprints and other foreign matter from visible surfaces of equipment, devices, luminaires, etc. Pay close attention to highly finished surfaces such as glass and polished metals. Wipe lamps clean.
- J. Maintain adequate ventilation during cleaning.
- K. Follow manufacturer's instructions. Failure to follow manufacturer's recommendations when cleaning equipment can result in damage from the use of improper cleaning methods or agents.

3.13. VISUAL AND MECHANICAL INSPECTION

- A. Verify that all equipment and their components are sized properly for the load and the types, sizes, etc. are in accordance with the contract documents, approved submittals, etc.
- B. Visually inspect equipment for physical damage. Repair physical damage, if practical and approved by the manufacturer. Consult Owner, Engineer and manufacturer for recommendations for suitable protective barriers to prevent future damage.
- C. Inspect molded and formed equipment and components (e.g. circuit breaker cases, fuses, starters, relays, insulators, supports, etc.) for cracks or other defects.
- D. Check all bolts, connections, cable terminations, etc. for tightness using a calibrated torque wrench or screwdriver. Refer to manufacturer's instructions and markings for proper torque values.
- E. Visually check the equipment, its components and associated raceways, conductors, etc. for proper grounding and bonding. Ensure that grounding and bonding terminal bars, bus bars, straps, and conductors are properly connected.
- F. Verify that cables do not contact live parts and that cables are properly secured to withstand the effects of fault currents.
- G. Check equipment anchorage, mounting, clearances, alignment and fit of components.
- H. Check that phase barriers are in place, if applicable.
- I. Visually check disconnect switch blade alignment, blade penetration, travel stops, and mechanical operation.
- J. Inspect each fuse holder to determine whether it seems to be adequately supporting the fuse and that the fuse holders are securely attached to the mounting base. Verify fuses are set tightly in the clips provided.

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- K. Operate equipment and components (e.g. disconnect switches, circuit breakers, etc.) to insure smooth operation.
- L. Motor bearings shall be checked for proper lubrication and the shaft turned to ensure it is free to rotate.
- M. Compare all circuits (internal and external) with wiring and/or control diagrams to verify they are installed correctly.
- N. Confirm correct operation and sequencing of electrical and mechanical interlock systems, if so equipped. Attempt closure on locked-open devices. Attempt to open locked-closed devices.
- O. Confirm that equipment nameplates and safety labels are provided.

3.14. TESTING

- A. The Contractor shall perform all tests required in the various sections of the specifications and in accordance with manufacturer's recommendations. Record test results and include in operation and maintenance manuals.
- B. The Contractor shall coordinate with and assist with the testing, calibration, systems coordination, etc. with the Owner for integration of the control panels, their components and other control and instrumentation devices as required into the Owner's system.
- C. The Owner and Engineer shall be notified one week prior to any testing so that the testing may be witnessed.
- D. All testing shall be performed by personnel that are trained in the specific task to be performed. Assistance by manufacturer's representative with testing shall be provided if requested by the Owner and/or Engineer without increase in contract sum.
- E. Do not proceed with tests until previously identified deficiencies are corrected.
- F. Test equipment in accordance with manufacturer's recommendations. Maintain test results for future comparisons. Include in operation and maintenance manuals.
- G. Upon completion, all equipment and systems shall be tested for functional operation, including all intended modes and sequences of operation.
- H. Readings of the voltage and amperage shall be taken on each phase at each panelboard and at the end of the longest branch circuit at no load and full load conditions.
- I. All systems shall test free from shorts and grounds and shall be without mechanical and electrical defects. If any test indicates a failure, in the opinion of the Engineer; the item shall be replaced or suitably repaired to the approval of the Owner and Engineer, and the test repeated without additional cost to the Owner.

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- J. The Owner's and/or Engineer's decisions shall be final regarding the acceptability and completeness of the installation and associated testing.

3.15. START-UP AND ENERGIZING

- A. The Contractor shall start up and test all equipment and systems for functional operation, including all intended modes and sequences of operation; except the Contractor shall assist Owner as required in the start-up and energization of process control and instrumentation systems furnished by the Owner.
- B. Start-up and energize equipment in accordance with manufacturer's recommendations.
- C. The Owner, Engineer and other affected personal shall be notified one week prior to energizing so that the energizing may be witnessed.
- D. Energize equipment, feeders, circuits, etc. from the source end and working to the load. Close main devices, feeder devices, motor/branch circuit devices, etc. in sequence.
- E. Verify all temporary grounding, etc. connections are removed prior to energizing.
- F. Verify that all load disconnecting, etc. devices are open, padlocked and tagged prior to energizing.
- G. Motors:
 - 1. Motors shall be started uncoupled to verify proper rotation. Reverse if required.
 - 2. With correct rotation, motors shall be run uncoupled for minimum 30 minutes. While running, motors shall be observed for unusual conditions such as vibration, noise, excessive winding or bearing temperature rise, etc.
- H. After energization, equipment shall be observed for unusual conditions such as vibration, noise, excessive temperature rise, etc.
- I. Readings of the voltage and amperage shall be taken on each phase at each panelboard and at the end of the longest branch circuit at no load and full load conditions.

3.09. CONTRACT CLOSE-OUT

- A. As a requirement for substantial completion of the Work, the Contractor shall thoroughly check the installation. Checking shall consist of visual inspection and manual adjustment to confirm correct installation and arrangement and to assure the intended function, response and operability. Checking shall include, as a minimum, the following:
 - 1. Check that equipment, devices, etc. are of the correct type and rating.
 - 2. Check that all raceways, fittings, devices, boxes, enclosures, etc. are secure and that all conduit connections are tight.

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3. Check that all electrical connections are correctly tightened.
 4. Check that equipment, devices, panelboard circuit directories, etc. are correctly labeled.
 5. Check that equipment, fixtures, devices, etc. are clean with all unnecessary labels removed.
- B. As a requirement for substantial completion of the Work, the Contractor shall:
1. Obtain final inspections from the authorities having jurisdiction.
 2. Perform final cleaning.
 3. Submit approved "As Built" Drawings, Record Documents, Test Records, Manuals, etc.
 4. Submit written warranty statements for equipment, materials and installation.
 5. Conduct system tests.
- C. After the requirements for substantial completion have been met, the contractor shall notify the Engineer in writing that the Work is substantially complete. The Engineer will then perform a final inspection of the installation and issue a "punchlist" for final completion.
- D. The Contractor shall complete the work on the punchlist or provide written explanation for not completing the work. The punchlist shall be signed by the contractor and returned to the Engineer when complete.
- E. The Engineer will re-inspect the Work to verify that all the items have been completed.
- F. The above process shall be completed a single time for the project. If additional punchlist and inspection cycles are required to be completed due to the contractor's failure to complete items on the punchlist, the contractor will be backcharged for the Engineer's additional services on time and material basis through the construction contract.
- G. Subsequent to final completion and testing operations, instruct Owner's authorized representatives as required in operation, adjustment and maintenance of equipment and systems.

End of Section 26 00 10

SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.01. APPLICABLE PROVISIONS

- A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

- A. The requirements of this Section and the other Division 26, 27, and 28 Sections apply to all the electrical work.
- B. Coordinate electrical work with related work shown and specified elsewhere.
- C. Provide all materials necessary for the proper execution and completion of the work as herein specified or called for on the drawings. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.
- D. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.

1.03. SUBMITTALS

- A. Provide submittals for the following:
 - 1. Low voltage cables.
 - 2. Warning Tape.

PART 2 - PRODUCTS

2.01. RACEWAYS

- A. Raceways, where required, shall be of the types listed below, unless noted otherwise:
 - 1. Electrical Metallic Tubing (EMT) - above grade, except as noted below.
 - 2. Polyvinyl Chloride Conduit (PVC) - below grade, except as noted below.
 - 3. Galvanized Rigid Steel Conduit (GRS) - Below grade conduit bends and risers.
 - 4. Galvanized Rigid Steel Conduit (GRS):
 - a. Below grade conduit bends and risers.

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- b. Above grade service entrance conduits.
 - c. Exterior exposed conduits, above grade.
- 5. Type MC Cable may not be used.
- 6. Flexible Metal Conduit (FLEX) - final connections to vibrating equipment and for fixture whips. Also, FLEX may be substituted for EMT for branch circuits between wiring devices and boxes concealed inside frame walls and ceilings. FLEX shall not be used for any homeruns, conduit stub-ups into accessible ceiling spaces, nor for any exposed or surface conduit runs except as final connections to vibrating equipment.
- B. Raceways shall be sized so that the cable fill does not exceed 40%; except, minimum conduit sizes shall be as follows:
 - 1. $\frac{3}{4}$ inch – above grade branch circuits, ancillary systems circuits or similar, except as noted below.
 - 2. 1 inch – branch circuit homeruns.
 - 3. 1 inch – below grade.
 - 4. 1 inch – telecommunications circuits terminating in a single outlet.
- C. PVC conduit shall be heavy-wall (Schedule 40), flame-retardant, suitable for use with 90°C cable, shall not distort from heat it will normally encounter and shall be resistant to low temperature and sunlight effects, impact and crushing.
- D. Galvanized rigid steel conduit (GRS) shall be hot-dipped galvanized with threaded couplings and connectors. Below grade steel conduits shall be coated with a suitable asphalt (or equivalent) compound for corrosion protection.
- E. Electrical metallic tubing shall be electro-galvanized steel.
- F. Flexible conduit shall be liquidtight type. Flexible conduit connections shall be a minimum of 18 inches long.
- G. Wireways shall be lay-in type with standard knockouts, screw covers for full channel access and the necessary complement of fittings, connectors, supports, etc. Wireways shall be of sufficient size to accommodate the required number of conduits and cables. Where indicated, or considered necessary, steel barriers shall be installed to separate circuits.
- H. Conduit elbows and bends in conduits 2 inch diameter and smaller shall be not less than 6 times the conduit diameter and bends in larger conduits shall be not less than 10 times the conduit diameter.
- I. Telecommunications (with or without cables), spare, c.o., etc. conduits shall be provided with pull rope below grade and pull string above grade.

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- J. Below grade telecommunications, spare, c.o., etc. conduits shall be plugged at both ends and their location properly marked.
- K. Yellow 3" wide polyethylene metalized warning tape shall be direct buried 12 inches above the topmost underground conduits. For multi-use excavations and trenches, provide multiple tapes.

2.02. RACEWAY FITTINGS

- A. Fittings for steel conduit shall be steel, galvanized or cadmium plated, threaded type. Couplings, locknuts and bushings shall be galvanized steel.
- B. Connectors, couplings, etc. for EMT shall be steel set-screw type; except, steel raintight compression type in potentially wet or damp locations (e.g. outdoors).
- C. Conduit bodies (i.e., type T, LB, LR, LL) shall be cast metal bodies with threaded connectors and screw covers. Increase size of bodies if required for fill and bending radius.
- D. Conduit bodies shall not be used in telecommunications system raceways.
- E. Fittings for flexible metal conduit shall be of a type specifically designed for the purpose.
- F. Fittings for nonmetallic conduits shall be of same manufacturer and material as the conduit.
- G. Conduit seals, in hazardous (classified) locations, shall be type EYS (Crouse-Hinds, Appleton, or approved equal) with sealing compound and fiber filler approved for the conditions and use, of the same manufacturer as the sealing fitting.
- H. Conduit terminations at equipment, etc. shall be suitably sealed and/or plugged at both ends to prevent the entrance of moisture. Spare, c.o., etc. conduits shall be provided with removable gasketed covers at the high end to prevent the flow of moisture from one box to another.
- I. End bells and/or insulated bushings shall be used on all underground conduit system terminations at vaults, junction boxes, padmounted equipment, etc.
- J. "Open" ends of spare conduits terminating in vaults and in telecommunications rooms shall be sealed with expandable plugs to prevent movement of air and water between spaces. Plugs shall be water and gas tight, with high-impact plastic components, elastic expandable gaskets and pull rope eyelet.
- K. "Open" end of telecommunications, spare, c.o., etc. conduits shall be provided with insulated bushings.
- L. Connectors at sheet metal enclosures shall have insulated throats.
- M. Provide approved properly bonded expansion fittings (capable of expansion and contraction as required), deflection couplings, etc. in all below grade conduits over 10 feet in length and/or

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wherever conduits pass over or through joints or other locations where raceways may be affected by dissimilar movements of the supporting structure.

2.03. BOXES

- A. Boxes shall accommodate any devices to be installed and shall be sized as required by the applicable codes for number and size of conduits and cables entering and leaving; except minimum as noted below.
- B. Flush mounted indoor boxes above grade in dry locations shall be standard stamped galvanized steel type, suitable for embedment in concrete and/or masonry where required.
- C. Surface mounted boxes and boxes installed in wet or damp locations and outdoors shall be threaded rigid body type, cast aluminum or galvanized iron.
- D. Exterior outlet boxes shall be flush mount and contain surface metal weatherproof while-in-use covers, gaskets, mounting rings, and all necessary mounting accessories. Provide trim rings suitable for use with the type of siding or exterior building wall material. Boxes shall be Intermatic model WP1010MC or approved equal.
- E. Surface mounted boxes installed in wet or damp locations and outdoors shall be threaded rigid body type, cast aluminum or galvanized iron.
- F. Unless noted otherwise, larger size pull and junction boxes shall be fabricated from code gauge galvanized steel.
- G. Switch, power outlet, device, etc. boxes shall be single or ganged to accommodate the required number of devices; except, flush mounted boxes shall be minimum 4 inches square for conduits 1 inches or less and $4^{11/16}$ inches square for larger conduits. Boxes containing a single device shall be minimum $1\frac{1}{2}$ inches deep. Boxes containing multiple devices shall be minimum $2\frac{1}{8}$ inches deep. Flush mounted boxes shall be equipped with plaster rings and suitable wallplates. Surface mounted boxes shall have raised surface type covers.
- H. Junction and pull boxes shall be sized as required by the NEC except the minimum size shall be 4 inch, square or octagonal as required, by $1\frac{1}{2}$ inches deep. Junction and pull boxes shall have full-access screw covers.
- I. Control, ancillary systems and similar outlet, device, junction, etc. boxes shall be in accordance with the requirements of the respective supplier; except, minimum as specified above.
- J. Boxes shall be equipped with mud rings where required and proper wallplates and/or covers.
- K. Openings in boxes, etc. through which cables are intended to pass shall be provided with suitable nonmetallic grommets.

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2.04. WIRE AND CABLE

- A. Wire and cable sizes indicated and/or specified are minimums only and shall be increased as required due to NEC, system, load, voltage drop, etc. requirements.
- B. All wire and cable (power, control, ancillary systems, etc.) installed in below grade conduit shall be suitable for wet locations.
- C. Ground electrode conductors shall be copper, bare below grade.
- D. Service and below grade feeder cable shall be single conductor stranded copper with 600 volt type XHHW insulation.
- E. Branch circuit cable, above grade feeder cable and equipment ground cable shall be single conductor copper with 600 volt type XHHW or THWN/THHN insulation. The minimum conductor size shall be #12 AWG; except, fixture whips provided as an assembly by the fixture manufacturer with the fixtures may be #14 AWG. Conductors shall be stranded, except #12 AWG lighting and general purpose receptacle branch circuit conductors may be solid.
- F. Line voltage (Class 1) control cable shall be single conductor stranded copper with 600 volt type XHHW or THWN/THHN insulation. The minimum conductor size shall be #14 AWG.
- G. Low voltage (Class 2) control cable shall be single conductor copper with 600 volt type XHHW or THWN/THHN insulation if installed in conduit. Low voltage (Class 2) control cable run "open" shall be multi-conductor copper with 300 volt insulation and an overall jacket, type CL2, listed as being resistant to the spread of fire; except in air handling plenums, cable shall be plenum rated, be listed as being resistant to the spread of fire and bear flammability testing ratings as cable type CL2P. The minimum conductor size shall be #16 AWG.
- H. Instrument cable, unless otherwise required by the particular instrument, shall be 2 conductor (twisted pair) solid copper with 300 volt PVC insulation, 100% aluminum polyester shield, stranded copper drain wire, and an overall PVC jacket. The minimum conductor size shall be #18 AWG.
- I. Cords shall be multi-conductor stranded copper with a green insulated grounding conductor, 600 volt type SO insulation and an overall neoprene jacket. Where installed in classified hazardous locations, the cable shall be extra hard usage type and rated for the appropriate classification. The minimum conductor size shall be #14 AWG.
- J. Fixture cable, where supplied by the Contractor, shall be stranded copper with 600 volt type PF insulation.
- K. Color coding for power cable shall be as follows:
 - 1. 480Y/277 volt, 3 phase, 4 wire:
Phase A = brown, B = orange, C = yellow, N = gray;
 - 2. 208Y/120 volt, 3 phase, 4 wire:
Phase A = black, B = red, C = blue, N = white;

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3. 120/240 volt, 1 phase, 3 wire:
Phase A = black, B = red, N = white;
4. Equipment ground cables shall be green.
5. Switch legs shall be the same color as the phase conductors. Switch travelers shall be purple.
- L. Cable pulling lubricants shall be gel type, of the best quality and shall not have any damaging effect on the insulation. (Ideal Yellow 77 is not approved.)

2.05. CABLE SUPPORTS

- A. Cable ties shall be utilized in panelboards, etc. to group and support conductors. All cable shall be fanned-out to terminals and identified by labels; or, if terminated on circuit breakers or control devices, by typewritten indexes or nameplates.

2.06. CABLE CONNECTIONS AND TERMINATIONS

- A. Taps and splices shall be kept to a minimum.
- B. Taps and splices in #8 AWG, and smaller, branch circuit cable shall be made with twist-on spring type wire nuts. Taps and splices in telecommunications cables, ancillary systems cables, larger branch circuit cables, feeder cables, control cables, etc. or below grade will not be allowed without specific approval from the Engineer.
- C. Taps and splices in handholes shall be made with proper size squeeze-type copper compression tap and splice connectors. (Mechanical set-screw type connectors will not be allowed.) All splices and taps in handholes shall be watertight, suitable for direct burial use, with an abrasion, UV and impact resistant cover pre-filled with chemically cross-linked silicone elastomer and silicon oil gel sealant. The gel and its cover shall completely encapsulate the splice and/or tap area. Tyco Electronics GelWrap or equal.

2.07. WARNING TAPE

- A. Yellow 3" wide polyethylene metalized warning tape shall be direct buried 12 inches above the topmost underground conduits. For multi-use excavations and trenches, provide multiple tapes.
- B. Tape shall be printed with the words:
 1. "Caution, Buried Power Line Below" or similar above electrical conduits.
 2. "Caution, Buried Lighting Line Below" or similar above lighting conduits.
 3. "Caution, Buried Data Line Below" or similar above telecommunications conduits.

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2.08. PULL STRING AND ROPE

- A. Pull string shall be resistant to rot and mildew and shall not deteriorate when exposed to oil, grease, etc.
- B. Pull rope shall be twisted polypropylene treated with ultraviolet stabilizers, minimum $\frac{1}{4}$ inch diameter. Rope shall be resistant to rot and mildew and shall not deteriorate when exposed to oil, grease, etc.

PART 3 - EXECUTION

3.01. RACEWAYS

- A. Raceways shall be installed straight, plumb and true and shall be without kinks or sags. Exposed raceway runs shall be either parallel or at right angles to walls and structural members, as neatly and unobtrusively as possible (e.g. adjacent to window and door trims and base, at wall/wall or wall/ceiling intersections, etc.).
- B. Below grade conduits shall be direct buried between 24 and 30 inches below grade (except, conduits below the building concrete floor slab may be run immediately below the floor) and/or as required to bury conduits below footings, grade beams, etc., and spaced a minimum of 2 inches between conduits. Underground conduits shall be suitably sealed or plugged at both ends and PVC conduit solvent welded to prevent the entrance of moisture.
- C. Raceways shall be located to not interfere with the removal of pipes or equipment for maintenance or repair. All raceways shall be kept a minimum of 6 inches away from items producing heat.
- D. Above grade raceways, fittings, etc. shall be securely supported from permanent structural members of building, either directly or indirectly. Raceways shall be fastened at intervals of 8 feet, nominally, and within 36 inches of each outlet, fitting, panel, etc. Single runs of exposed conduit shall be supported with steel pipe straps. Conduit shall not be supported from piping or from other conduits but only from building structural elements.
- E. Bends in raceways shall be made without flattening, kinking or reducing the cross-sectional area of the raceway.
- F. All raceway cuts shall be made square with a proper cutting tool. The inside and outside of all raceway ends shall be reamed after cutting and/or threading to eliminate burrs and rough edges, then wiped clean. Joints shall be cut square and shall butt solidly into couplings. Running threads will not be permitted.
- G. Raceways shall be closely and tightly fitted in couplings, connectors, boxes, etc. to provide an electrically continuous low resistance ground fault return path. Threaded joints shall be made up with at least 5 threads fully engaged.

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- H. The raceway systems shall be complete (including the installation of bushings, grommets, etc.), snaked and cleaned, and approval of the installation is obtained from the Owner and Engineer, before pulling any cable.
- I. Metalized warning tape shall be direct buried 12 inches above the topmost underground conduits. For multi-use excavations and trenches, provide multiple tapes.

3.02. EXCAVATION AND BACKFILLING

- A. Excavate to depths noted, and as required for proper completion of all below grade work and cut to sufficient size to provide ample room for construction of forms, shoring and bulkheads as required.
- B. Underground utilities (electrical, water, sewer, cable television, etc.) are known to exist in the area of construction. The location of existing utilities shown on the drawings is approximate only and is not guaranteed to be an indication of all utilities in the area. The contractor is responsible for contacting the Owner and all utility companies and for field location of all utilities prior to construction. The one-call number for underground utility location services is 811 (1-800-424-5555). The Contractor shall promptly notify the Engineer of any conflicts between the contract documents and field location of existing utilities. The Contractor is responsible for maintaining the integrity of all existing utilities during construction and shall be responsible for repairing and/or replacing (as required) all that he damages, known or unknown, located or not located.
- C. Damaged electrical and telecommunications (telephone, computer/data, television, fiber, copper, etc.) cables shall be replaced in their entirety. Splicing will not be allowed.
- D. Provide a spotter at all times when excavation occurs by use of a backhoe, excavator or other mechanical equipment.
- E. Shore and brace excavations where necessary to prevent cave-ins and in accordance with all safety laws and codes.
- F. During excavations and backfilling, extreme care shall be taken to keep rocks and other rough material away from conduits and cables. Pack a minimum of 6 inches of soft fill material (free from stones, rocks and other rough material that might be forced against the conduits and cables during backfilling, or when settling or frost-heaving disturbs the surrounding earth) around conduits and cables. Wash in to avoid air gaps.
- G. Backfill shall be good compactable material without large rocks, chunks or sticks. Backfill in all excavations shall be progressively compacted in maximum 12 inch lifts to 95% of maximum density, and shall be without voids.
- H. Prior to excavation, the Contractor shall mark or otherwise show the location of all equipment and vaults, and obtain specific approval from the Owner and Engineer for the location of each prior to installing equipment, boxes, raceways, etc.
- I. Maintain all bench marks, control monuments and stakes, whether newly established by Surveyor or previously existing. Protect from damage and dislocation. If necessary to disturb existing benchmark, re-establish in a safe place.

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- J. The clearance between the underground conduit systems and other underground items, such as water and sewer lines shall be as large as necessary to permit maintenance of any of the systems without damage to the other items.
- K. Keep all excavations, pits, trenches, etc., entirely free from water. Protect excavations from rain or water from any source during construction. Use suitable pumping equipment or other means as required by conditions. Continue pumping as necessary until completion of work.
- L. When operations are interrupted by unfavorable weather conditions, prepare areas by grading and compaction to avoid ponding and erosion.
- M. Dirt shall not be permitted to accumulate on roads or adjacent green belts, nor to be washed into drainage ditches.
- N. Appropriate steps, such as the application of water, shall be taken to prevent airborne dust due to the work, particularly during excavation and moving of materials.
- O. Trenches, excavations and any damage to adjoining areas shall be repaired/restored to existing or better condition to the approval of the Owner and Engineer.

3.03. WARNING TAPES

- A. Direct bury warning tape 12 inches above topmost conduits. For multi-use excavations and trenches, provide multiple tapes. Tapes shall extend into vaults and be stubbed up with and secured to conduits as required for access when tracing or locating.

3.04. LABELING & IDENTIFICATION

- A. Junction boxes concealed in ceiling spaces and exposed in electrical, mechanical, utility rooms, and the like shall be marked with the panel and circuit numbers contained within. Marking shall be legibly hand-written with black indelible ink marker.
- B. In each junction and pull box, neutral conductors shall be grouped with associated phase conductors by taping the conductors together.
- C. Interior spare, C.O., etc. conduits shall be labeled with their destination. Labeling shall be made by neatly hand writing on the conduits or enclosures with indelible marker.
- D. Exterior below grade conduits entering electrical rooms, communications rooms, enclosures, vaults, etc. shall be labeled with their destination. Labeling shall be made by neatly hand writing on the conduits or enclosures with indelible marker.
- E. Color coding for power cable shall be as follows:

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1. 480Y/277 volt, 3 phase, 4 wire:
Phase A = brown, B = orange, C = yellow, N = gray;
2. 208Y/120 volt, 3 phase, 4 wire:
Phase A = black, B = red, C = blue, N = white;
3. 120/240 volt, 1 phase, 3 wire:
Phase A = black, B = red, N = white;
4. Equipment ground cables shall be green.
5. Switch legs shall be the same color as the phase conductors. Switch travelers shall be purple.

3.05. BOXES

- A. Boxes shall be installed plumb and true and be firmly supported either directly or indirectly by a sound and safe structural member of the building with approved anchors and fasteners, and shall be readily accessible for maintenance.
- B. Pull boxes or fittings shall be provided in conduit runs as required to prevent excessive stress on the cables during pulling and to allow the minimum required bending radius.

3.06. WIRE AND CABLE

- A. All wire and cable shall be enclosed within the raceway system.
- B. Inspect cable prior to installation to verify that it is identified properly on the reel or box identification label, that it is of proper gauge, containing correct number of pairs, etc. Note any buckling of the jacket which would indicate possible problems. Damaged cable or any other components failing to meet specification shall not be used in the installation.
- C. Conductors of different voltages, systems, functions, etc. shall not be combined in the same raceway or cable unless specifically noted otherwise.
- D. Wire and cable shall not be exposed to weather or mechanical damage longer than necessary. Cut ends of cable shall immediately be sealed.
- E. Cable shall be unrolled from reels, or removed from cartons, and installed in a manner which will prevent kinking, crushing or excessive tension on conductors and insulation. Use only guides, rollers, sheaves, etc. that are free-turning and clean. Cable shall not be dragged on the ground or over sharp edges or abrasive surfaces. Slack wire shall be provided at all pull points.
- F. Cable shall be installed or drawn into the raceway system only after all work of any nature that might cause injury to the cable is completed. The raceway system shall be complete, snaked and cleaned before pulling any cable.
- G. All cables shall terminate in an approved enclosure or fitting.

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- H. Cable pulling lubricants shall be used to minimize pulling stresses on cable pulled into raceways.
- I. All cable is subject to subtle damage that may degrade future performance, if abused during installation. In all cable installation, set reels and use sufficient pulleys and manpower so that cables are not pulled around corners or against material that might cause chafing.

OBSERVATION OF IMPROPER CABLING HANDLING TECHNIQUES MAY CAUSE THE CONSULTANT/ENGINEER AND/OR OWNER TO REQUIRE THE CONTRACTOR TO DISCARD AFFECTED CABLES, INCLUDING ANY OTHERS ALREADY INSTALLED BY THE PERSONNEL FOUND USING INCORRECT PROCEDURE.

- J. Conductor connections shall be made with connectors of the proper size and type. Compression connections shall be made with the correct die and number of crimps, or the correct tightening torque in the case of mechanical connectors, according to manufacturer's instructions and recommendations. Use suitable oxide inhibiting joint compound on all aluminum terminations. Care shall be taken to not nick conductors during insulation removal.
- K. At pulling points, the cables shall be neatly bundled by circuit.
- L. Taps and splices shall be kept to a minimum; and are not allowed in cables larger than #8 AWG, control cable, ancillary systems cable, etc. and below grade without prior approval from the Engineer.
- M. Conductor connections shall be made with connectors of the proper size and type. Compression connections shall be made with the correct die and number of crimps, or the correct tightening torque in the case of mechanical connectors, according to manufacturer's instructions and recommendations. Use suitable oxide inhibiting joint compound on all aluminum terminations. Termination of insulated conductors shall be made so that the stripped length of bare conductor is not longer than required for the terminal or connector. Care shall be taken to not nick conductors during insulation removal.
- N. At pulling points, the cables shall be neatly bundled by circuit.
- O. Field wiring shall not contact live parts.
- P. Cables shall not be supported by their terminations. Suitable cable ties and/or supports shall be utilized in switchboards, panelboards, terminal boxes, junction boxes, vaults, etc. to group and support conductors. All cable shall be fanned-out to terminals and identified by labels; or, if terminated on circuit breakers or control devices, by typewritten indexes or nameplates.
- Q. Insulated cable supports shall be provided to relieve any strain imposed by cable weight or movement, and to secure cable as required to withstand the effects of fault currents.

3.07. CABLE TESTING

- A. Service and feeder cables, including panels with branch circuit breakers open, shall have the insulation resistance to ground measured with other phases grounded after all splices and terminations are made; except, before connection to utilization equipment, fixtures, etc. Test cables phase to phase and phase to ground, with the other phase(s) grounded. Insulation resistance shall

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be measured using a 500 volt megger, Measure insulation resistance at one minute following the application of the test voltage. The minimum reading shall be 1.0 megohms. Ground each phase at the completion of the test.

- B. Control and branch circuits do not require an insulation test, functional tests only are required; except, all receptacles shall be tested for correct connection using a suitable receptacle tester.

3.08. PENETRATIONS

- A. Wall, ceiling and floor penetrations by raceways (both inside and outside the raceway), cables, etc. shall be sealed to maintain the original moisture, dust and fire resistance to the approval of the Engineer.
- B. Do not cut, notch or drill structural framing members for the installation of raceways without the Engineer's approval in each case. Holes and penetrations where allowed in studs, joists and other structural members for raceways and cables shall be of a size to allow for a tight fit.
- C. Flash and counter-flash all roof penetrations.

3.09. PULL STRINGS AND ROPES

- A. Provide pull ropes in all below grade telecommunications (with and without cables), spare, etc. conduits.
- B. Provide pull strings in all above grade telecommunications (with and without cables), spare, etc. conduits.

3.10. CONTROL SYSTEM

- A. The Contractor shall coordinate with control systems suppliers and provide conduit, boxes, cables, etc. in accordance with their requirements; except, minimum as indicated and/or specified.

End of Section 26 05 00

SECTION 26 05 26 – GROUNDING

PART1 - GENERAL

1.01. APPLICABLE PROVISIONS

- A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

- A. The requirements of this Section and the other Division 26, 27 and 28 Sections apply to all the grounding work.
- B. Coordinate grounding work with related work shown and specified elsewhere.
- C. Provide all materials necessary for the proper execution and completion of the work as herein specified or called for on the drawings. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.
- D. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.

PART 2 - PRODUCTS

2.01. GROUNDING

- A. Ground rods shall be copper clad steel, $\frac{5}{8}$ inch diameter by 10 feet long minimum.
- B. Ground clamps, nuts, washers, etc. shall be corrosion resistant high copper alloy or silicon bronze; except, below grade and foundation rebar ground connections shall be exothermic welded (Cadweld or approved equal) or copper compression type.
- C. Ground clamps, nuts, washers, etc. shall be corrosion resistant high copper alloy or silicon bronze; except, below grade ground connections and connections within the Sewer Pump Station wet and dry wells shall be exothermic welded (Cadweld or approved equal) or copper compression type.
- D. Feeder circuits, branch circuits, control circuits, etc. shall include a separate equipment ground cable (sized the same as the largest circuit conductor, unless otherwise noted) run in the same raceway with the circuit conductors. Equipment ground conductors for feeder circuits, branch circuits, control circuits, etc. installed in metallic raceways shall be redundant, consisting of both an electrically continuous metal raceway system and the separate equipment ground cable run in the same raceway with the circuit conductors.

SECTION 26 05 26 – GROUNDING

2.02. PANELS

- A. Provide both ground and neutral bars in panels, motor control centers, etc.. All connectors and lugs shall be solderless, pressure type suitable for copper or aluminum wire.

2.03. WIRE AND CABLE

- A. Ground wire and cable sizes indicated and/or specified are minimums only and shall be increased as required due to National Electrical Code, system, load, voltage drop, etc. requirements.
- B. Ground electrode conductors shall be copper, bare below grade.
- C. Equipment ground cable shall be single conductor copper with 600 volt type XHHW or THWN/THHN insulation. Conductor size shall match feeder, branch circuit, etc. conductor size unless noted otherwise. Conductors shall be stranded, except #12 AWG lighting and general purpose receptacle branch circuit conductors may be solid.

PART 3 - EXECUTION

3.01. GROUNDING

- A. All electrical equipment, enclosures, boxes, devices, etc. shall be provided with a ground fault return path both by means of an insulated grounding conductor installed with the circuit conductors and the integrity of the raceway system. Bond raceway system as required.
- B. Ground terminals of all equipment, devices, etc. shall be grounded by the equipment ground conductor.
- C. Raceways shall be closely and tightly fitted in couplings, connectors, boxes, etc. to provide an electrically continuous low resistance ground fault return path. Threaded joints shall be made up with at least 5 threads fully engaged.
- D. Building steel and interior metal piping systems shall be suitably bonded.
- E. Service shall be grounded to the concrete encased grounding electrode (foundation rebar). Contractor shall verify that the foundation concrete is in direct contact with earth and is not insulated from contact by a vapor barrier or by moisture sealant paint. Where the concrete reinforcing bars are not suitable for use as a grounding electrode, Contractor shall provide minimum 20 feet of # 4 AWG ground cable encased in the concrete.
- F. Service shall be grounded to the driven ground rods.
- G. Exothermic welded connections shall be done strictly in accordance with manufacturer's instructions, and then enclosed in an air-tight sealing compound to prevent moisture intrusion and minimize corrosion. Molds shall not be altered. All connection materials shall be of the same manufacturer.

SECTION 26 05 26 – GROUNDING

- H. Connections shall be both mechanically and electrically secure. Torque connecting hardware in accordance with the manufacturer's instructions and recommendations.
- I. Torque connecting bolts at telecommunications grounding busbars to 35 ft/lbs.
- J. Compression connections shall be made with the correct die and number of crimps, or the correct tightening torque in the case of mechanical connectors, according to manufacturer's instructions and recommendations.
- K. Grounding conductors exposed to mechanical damage shall be protected with PVC conduit sleeves with bushings.
- L. Before grounding connections are made, contact surfaces shall be thoroughly cleaned. Connections shall be both mechanically and electrically secure.
- M. Tests shall be made to verify the continuity of the ground system and all ground fault return paths.
- N. After completion of the grounding system, the resistance of the grounding network to earth shall be measured using a ground megger using a fall of potential test method. Driven ground rods shall be disconnected and tested separately from the grounding system. The minimum ground earth resistance shall be maximum 25 ohms.

End of Section 26 05 26

SECTION 26 07 00 – THERMAL & MOISTURE PROTECTION

PART 1 - GENERAL

1.01. APPLICABLE PROVISIONS

- A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

- A. The requirements of this Section and the other Division 26, 27, and 28 Sections apply to all the thermal & moisture protection work.
- B. Coordinate thermal & moisture protection work with related work shown and specified elsewhere.
- C. Repair of existing roofing and flashing altered by work of demolition and construction, including restoration of base, insulation, membranes, flashing, adhesives, sealants, and roofing accessories integrally related to roof installations.
- D. Perform investigation and analysis of roof membrane and insulation to determine composition of existing systems prior to beginning of the work of this section. Match existing materials and assemblies in repair of roofing and flashing.
- E. Provide all materials necessary for the proper execution and completion of the Work as herein specified or called for on the drawings. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.
- F. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.

PART 2 - PRODUCTS

2.01. GENERAL

- A. Coordinate the features of materials and equipment so they form an integrated system.

2.02. MOISTURE PROOFING

- A. Moisture proofing systems shall be designed and installed to allow the passage of cable, conduit or pipe through exterior walls, etc. and vaults. They shall provide a barrier seal to prevent the penetration of water and gases into the structure to be penetrated.
- B. Provide roofing materials recognized to be specifically for use with the type of roofing surface penetrated. Products shall be tested to show compliance with indicated performances, or provide

SECTION 26 07 00 – THERMAL & MOISTURE PROTECTION

other similar materials certified in writing by manufacturer to be equal or better than specified in every respect.

2.03. FIRE STOPPING AND SEALING MATERIALS

- A. Fire-stop systems shall be designed and installed to allow the passage of cable, conduit or pipe through fire rated walls or floors. They shall provide a barrier seal to prevent the penetration of fire, smoke, water, and gases, with a fire rating to match the rating of the architectural assembly or structure to be penetrated.
- B. Fire-stop systems shall be resistant to direct hose spray.
- C. Fire-stop systems shall consist of one or more of the following materials:
 - 1. Ablative (typical of silicone-based technology).
 - 2. Cementitious (Can be troweled like grout or mortar, but is specifically rated for the purpose. Grout shall not be permitted).
 - 3. Elastomeric (Flexible substance which resembles rubber).
 - 4. Endothermic (Absorbing heat energy.).
 - 5. Intumescent (Swelling under the influence of heat, pillows, etc.).
 - 6. Mechanical (Assemblies that allow additions or deletions).
- D. Fire-stop systems shall be UL classified for the intended use.
- E. Wall, ceiling and floor sleeves and the like shall be metallic raceways with intumescent bags or bricks; except, at the option of the Contractor, sleeves may be metallic wireways (sized to match the required raceways) which contain an intumescent insert material that adjusts automatically to cable additions or subtractions, Specified Technologies EZ Path, 3M Fire Barrier Pass-Through, or approved equal.
- F. Fire-stop material around cable penetrations, within raceways (except wall and floor sleeves), etc. shall be intumescent bags, bricks, or soft, pliable, non-hardening intumescent putty, with high dielectric strength (insulator). Material shall allow removal of the material(s)/system(s) for future cable additions and/or removals.
- G. Drywall joint compound, concrete, and mineral wool shall not be used as fire stopping materials.
- H. Fire-stop products shall be as manufactured by 3M, Dow Corning, Hilti, Nelson, Specified Technologies, Unique Fire Stop Products, or approved equal.

SECTION 26 07 00 – THERMAL & MOISTURE PROTECTION

2.04. DUST SEALING MATERIALS

- A. Dust seal systems shall be designed and installed to allow the passage of cable, conduit or pipe through non-rated ceilings, walls, partitions or floors.
- B. Dust sealant around raceways and the like shall be top grade paintable silicone based or poly-sulfite caulk, or expanding foam type sealant.
- C. Dust sealant around cable penetrations, within raceways, etc. shall allow removal of the material for future cable additions and/or removals.

PART 3 - EXECUTION

3.01. INSTALLATION

- A. Provide all fire-stop sealing for all penetrations through fire-resistance-rated floors, walls and partition construction; including empty openings and openings containing cables, raceways, cable trays, cable racks, sleeves, supports and other penetrating items as required, both new and existing where new cables, raceways and the like have been installed. Contractor is responsible for verifying the fire rating of the barrier to be penetrated.
 - 1. Install fire-stop systems in accordance with manufacturer-tested methods and to manufacturer's instructions. If required, extend fire-stop system through the full thickness of the wall or floor and through the full length of the sleeve.
 - 2. Seal openings with a removable fire-stop material after each shift. Do not leave unattended openings in building fire-resistance-rated walls, partitions and floors at any time during construction.
- B. Where sleeves or penetrations are installed through non-rated partitions, provide a dust seal to prevent dust from migrating between the spaces separated by the partition. Also, where fire stop material does not completely fill an opening (e.g. intumescent pillows), provide suitable dust sealant as required.

3.02. MOISTURE PROOFING

- A. Conduit terminations at equipment, etc. shall be suitably sealed and/or plugged at both ends to prevent the entrance of moisture.
- B. Underground conduits extending into buildings and at transformers, switchgear, etc. shall be suitably sealed or plugged at both ends. Underground conduits between vaults shall be suitably sealed or plugged at the high end. Sealant shall be removable. Ductseal is not acceptable.
- C. Conduit penetrations through retaining walls and building exterior walls shall be suitably sealed and/or grouted to prevent the entrance of moisture.

SECTION 26 07 00 – THERMAL & MOISTURE PROTECTION

- D. PVC conduit shall be solvent welded to prevent the entrance of moisture.
- E. Comply with manufacturer's installation instructions and recommendations particular to each product for all roof penetrations. Repair existing roofing and flashing altered by work, including restoration of base, insulation, membranes, flashing, adhesives, sealants, and roofing Accessories integrally related to roof installations. Clean all effected surfaces prior to roofing work. Flash and counter-flash all roof penetrations.

End of Section 26 07 00

SECTION 26 20 00 – ELECTRICAL TRANSMISSION & DEVICES

PART 1 - GENERAL

1.01. APPLICABLE PROVISIONS

- A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

- A. The requirements of this Section and the other Division 26, 27, and 28 Sections apply to all the electrical work.
- B. Coordinate electrical work with related work shown and specified elsewhere.
- C. Provide all materials necessary for the proper execution and completion of the work as herein specified or called for on the drawings. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.
- D. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.

1.03. SUBMITTALS

- A. Provide submittals for the following:
 - 1. Meter Base
 - 2. Panelboards.
 - 3. Surge arrestor.
 - 4. Wiring devices.
 - 5. Limit Switches.

PART 2 - PRODUCTS

2.01. ELECTRIC POWER SERVICE

- A. Utility meter base shall be surface mounted, NEMA 3R, in accordance with the requirements of Puget Sound Energy Co. for the service size and type indicated.

2.02. PANELS

- A. Panel shall be dead-front, circuit breaker type panelboard, suitable for use as service entrance equipment where required. Branch circuits shall be arranged using double row construction.

SECTION 26 20 00 – ELECTRICAL TRANSMISSION & DEVICES

Interiors shall be rigid and so designed that circuit breakers can be replaced, changed or added without disturbing adjacent units and without machining, drilling, or tapping.

- B. Busses shall be copper or tinned aluminum. Ground and neutral bars shall be provided. All connectors and lugs shall be solderless, pressure type suitable for copper or aluminum wire.
- C. Panels shall all be of the same manufacturer, Eaton, General Electric, Siemens, or Square D, no substitutions.
- D. Circuit breakers shall be bolt-on, molded-case, thermal magnetic, quick make-quick break type with trip indicating handles. Branch circuit breakers for motor loads shall be HACR type. Branch circuit breakers for lighting loads shall be SWD type. Multi-pole breakers shall be single-handle, common trip. Tandem breakers shall not be used. Main and/or feeder and branch circuit breakers shall be series short circuit rated. Provide padlocking devices on circuit breakers where required.
- E. Circuit breakers for installation in the existing panelboard(s) shall be of the same manufacturer, and be of a type manufactured specifically for that type, vintage and short circuit rating of the panelboard.
- F. Provide approved handle ties between single pole circuit breakers for all multiwire branch circuits as required.
- G. Panels and circuit breakers shall be fully short circuit rated. Series rating of circuit breakers will not be allowed.
- H. Spaces shall be bussed for the maximum device that can be fitted into them, and shall be equipped with mounting and connecting accessories for future installation of circuit breakers.
- I. Panels shall be suitable for top and bottom entry of feeder and branch circuit conduits, cables, etc.
- J. Panels shall be industrial/commercial type panelboards with hinged door, catch and lock (all keyed alike). Residential type loadcenters will not be allowed.
- K. Panels and each feeder breaker in each (clearly and accurately identifying the function and location) shall have laminated plastic master nameplates. The panelboard nameplate shall include the name of the panel and the name and location of the equipment from which the power originates.
- L. Panels shall be provided with laminated plastic nameplates to identify the system color coding scheme for phase and neutral conductors as required.
- M. Panels shall be provided with warning nameplates to warn personnel of potential arc flash and shock hazards in compliance with the NFPA 70E standard. Nameplates shall include the voltage system, arc flash boundary limits and PPE category specific to the location.
- N. Panels shall have a circuit directory frame and card with a transparent cover furnished on the door. Directory cards shall have a typewritten index clearly and accurately identifying the function and location (using the room name and numbering system shown on the Architectural plans) of the circuit. Provide new typewritten circuit directory cards for all existing panels that are modified in any way.

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- O. Circuit directory cards shall be arranged to match the physical arrangement of the breakers, with odd numbered circuits on the left side of the card and even numbered circuits on the right side of the card. Where required due to the size of the directory frame, the odd numbered circuits may be on a separate card from the even numbered circuits. Odd and even numbered circuits shall not be intermingled together.

2.03. SURGE ARRESTORS

- A. Surge arrestors shall be a heavy-duty secondary surge protective devices, UL 1449, third edition listed. Surge arrestors shall be bi-polar and bi-directional, providing all mode protection (L-L, L-N, L-G and N-G) and EMI/RFI filtering. Surge arrestors shall be Category C suitable for service entrance protection at the main service switchboard and Category C for panelboard protection at the downstream panels. The suppression system shall incorporate metal-oxide varistors (MOVs) as the core surge suppression component. Each unit shall include a high-performance EMI/RFI noise rejection filter. All components and diagnostics shall be contained within one discrete assembly. Enclosures shall be weatherproof, with hinged cover and status indication.
 - 1. Surge arrestors shall be rated for minimum 160,000 amps peak surge current capacity per phase and 80,000 amps per mode at the main service circuit breaker.
- B. Surge arrestors shall be separately mounted, not integral with the panel.
- C. Surge arrestors shall be Equalizer Series manufactured by Innovative Technology, ServiceTrack ST series by Total Protection Solutions, with a 10 year warranty minimum, or approved equal.

2.04. WIRING DEVICES

- A. Wiring devices shall be specification grade, all of the same manufacturer, ivory colored.
- B. Lighting switches shall be toggle, AC quiet type rated 20 amps, 120-277 volt.
- C. General purpose receptacles shall be 20 amp, 125 volt, AC, straight blade, 3-wire grounding type.
- D. Ground fault interrupter (GFI) type receptacles shall be duplex, Class A, 15 amp, 125 volt. Provide individual ground fault interrupter type receptacles at each location indicated or as required. Feed-through type protection of multiple outlets will not be allowed.
- E. Special purpose receptacles shall be of the type, ratings and design for the use intended, NEMA configuration.
- F. Surface mounted devices shall have raised surface type covers, galvanized steel.
- G. Weather-proof receptacles shall be equipped with heavy duty die cast while-in-use covers. Covers shall maintain a weatherproof rating whether or not an attachment plug is inserted. Intermatic WP3110MXD series, or approved equal.

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- H. Definite purpose devices shall be labeled with a description of the device's function, rating and circuit identification.
- I. All outlets shall be labeled with the panel and circuit number(s) from which the device is fed. Labels shall be heavy duty adhesive type, clear with black letters on light colored devices and clear with white letters on dark colored devices. Lettering shall be appropriately sized for the application, except minimum $\frac{1}{4}$ inch. Labels on ceiling mounted devices shall be large enough to read from the floor. Labels shall be as manufactured by Kroy, Brothers, or approved equal. Self-adhesive circuit numbers, masking tape, plastic punch type "Dymo" labels, etc. are not acceptable.

2.05. LIMIT SWITCHES

- A. Limit switches shall be heavy-duty industrial type, suitable for installation outdoors with lever arms, strikes, etc. as required for the intended function. Contacts shall be form C type (SPDT), quantity as required, rated minimum 300 volt, 10 amp AC and DC continuous.

2.06. EQUIPMENT IDENTIFICATION

- A. Provide nameplates for all equipment and other devices used for the control of circuits, equipment, etc.
 - 1. Panelboards and each feeder circuit breaker within each.
 - 2. Circuit breakers, bus gutter, etc.
 - 3. Motor starters, contactors, etc.
 - 4. Separately mounted circuit breakers.
 - 5. Disconnect switches.
 - 6. Control and contactor panels, and each device within each.
 - 7. Control stations and their devices.
- B. All distribution equipment (switchboard, panelboards, control panels, etc.) shall be provided with laminated plastic nameplates to identify the system color coding scheme for phase and neutral conductors as required.
- C. All distribution equipment (switchboard, panelboards, control panels, etc.) shall be provided with warning nameplates to warn personnel of potential arc flash and shock hazards in compliance with the NFPA 70E standard. Nameplates shall include the voltage system, arc flash boundary limits and PPE category specific to the location.
- D. Definite purpose devices shall be labeled with a description of the device's function, rating and include the panel and circuit number(s) from which it is fed.

SECTION 26 20 00 – ELECTRICAL TRANSMISSION & DEVICES

- E. All equipment and outlets shall be labeled with the panel and circuit number(s) from which it is fed.
- F. Labels shall be heavy duty adhesive type, clear with black letters on light colored devices and clear with white letters on dark colored devices. Lettering shall be appropriately sized for the application, except minimum ¼ inch. Labels on ceiling mounted devices shall be large enough to read from the floor. Labels shall be as manufactured by Kroy, Brothers, or approved equal. Self-adhesive circuit numbers, masking tape, plastic punch type "Dymo" labels, etc. are not acceptable.
- G. Nameplates shall adequately describe the function or operation of the identified equipment, devices, etc. and, where applicable, include the panel and circuit number(s) from which it is fed. Nameplate designations shall be consistent with the project documents. Submit proposed inscriptions for approval.

PART 3 - EXECUTION

3.01. TEMPORARY POWER

- A. The Contractor shall provide all temporary power services, facilities, equipment, devices, material, etc. required for the construction; including adequate lighting, outlets, balancing, testing, etc. as may be necessary for the proper performance and inspection of the work.
- B. During power interruptions, and if Contractor's equipment will not operate on the available power, the contractor shall supply all equipment needed, such as transformer(s), generator(s), etc. and pay all costs involved.
- C. The temporary power system shall be provided in a neat and safe manner, in compliance with governing codes and good working practice.
- D. The temporary power system shall be removed when no longer required.

3.02. LOCATIONS

- A. The mounting heights and location of similar equipment and devices shall be consistent, in accordance with the requirements of the ADA where applicable. Special purpose items shall be located conveniently for the purpose intended.
- B. Devices shall be located to not interfere with the removal of pipes or equipment for maintenance or repair. All devices shall be kept a minimum of 6 inches away from items producing heat.
- C. Panels, starters, circuit breakers, etc. shall be wall mounted, 6½ feet to top above the floor. Circuit breakers, etc. shall, in no case, be installed so that the grip of the operating handle, when in its highest position, is more than 6½ feet above the floor or working platform.
- D. Prior to rough-in, the Contractor shall mark or otherwise show the location of all equipment and devices locations, and obtain specific approval from the Owner and Engineer for the location of each prior to installing enclosures, boxes, raceways, etc.

SECTION 26 20 00 – ELECTRICAL TRANSMISSION & DEVICES

- E. Outlets (power, telecommunications, etc.) shall be mounted 18 inches to bottom above finished floor unless noted otherwise; except, outlets above counters, etc. shall be mounted 6 inches to centerline above the counter or 3 inches to centerline above the splashboard, whichever is higher.
- F. Locate light switches, etc. 6 inches from door casings (except on center in spaces less than 12 inches), 42 inches to centerline above finished floor.

3.03. EQUIPMENT AND DEVICES

- A. Equipment, devices, enclosures, etc. shall be installed plumb and true and shall be square with the adjacent walls, ceilings and structural members. The location of similar items shall be consistent.
- B. Equipment, cabinets, boxes, etc. shall be accurately mounted and leveled and be firmly supported either directly or indirectly by a sound and safe structural member of the building in accordance with manufacturer's instructions, or as directed. Supports shall be neatly placed and properly fastened.
- C. The correct lifting, jacking and/or moving gear which will prevent damage to the equipment shall be used.
- D. All bolts, nuts, screws and other fastenings shall be tightened and all covers replaced on equipment and boxes. All electrical connections, particularly those on bus work in panelboards, etc. shall be checked to ensure tightness and electrical conductivity. All gaskets, seals, etc. shall be checked for proper fit.
- E. Follow manufacturer's installation details wherever available. Provide all boxes, mountings, wiring or fittings required, standard or special.
- F. The Contractor shall touch-up paint all scratched, marred or damaged factory finish on equipment, devices, enclosures, etc.

3.04. EQUIPMENT TESTING

- A. Before testing, visually inspect equipment thoroughly, and perform mechanical operation tests in accordance with manufacturer's instructions.
- B. Before energization, the insulation resistance of the transformer windings shall be tested with a 500 volt megger. Test primary insulation to ground with tank and secondary winding grounded. Test secondary winding insulation to ground with tank and primary winding grounded. The minimum acceptable insulation resistance to ground is 8 times the KV rating of the winding under test.
- C. Insulation Resistance Tests:
 - 1. Test using a 500 VDC or 1000 VDC megohmmeter.
 - 2. Ground all phases not being tested.

SECTION 26 20 00 – ELECTRICAL TRANSMISSION & DEVICES

3. Measure insulation resistance at one minute following the application of the test voltage.
 4. Ground each phase at the completion of the test.
- D. Compare test results with factory-obtained results and results on similar equipment. Investigate variations. Consult manufacturer for recommendations.
- E. Upon completion, all equipment and systems shall be tested for functional operation, including all intended modes and sequences of operation.
- F. Record the values of each test, along with the description of the instrument, voltage level, temperature, time, and date of the test on the form included in the contract documents. Sign the results.

End of Section 26 20 00

SECTION 26 50 00 – LIGHTING

PART 1 - GENERAL

1.01. APPLICABLE PROVISIONS

- A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

- A. The requirements of this Section and the other Division 26, 27, and 28 Sections apply to all the lighting and lighting control work.
- B. Coordinate lighting and lighting control work with related work shown and specified elsewhere.
- C. Provide all materials necessary for the proper execution and completion of the work as herein specified or called for on the drawings. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.
- D. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.

1.03. QUALITY ASSURANCE

- A. The lighting systems and all controls shall be in accordance with the Washington State Non-Residential Energy Code (NREC).

1.04. SUBMITTALS

- A. Provide submittals for the following:
 - 1. Lighting fixtures.
 - 2. Photocells.

PART 2 - PRODUCTS

2.01. LIGHTING

- A. Light Emitting Diode (LED) luminaires shall have a luminous efficacy of at least 90 lumens/W, a CRI of at least 80, an estimated life of at least 50,000 hours at 70% lumen maintenance, and shall include a minimum 5-year warranty on the entire luminaire including the driver. The luminaire and LEDs shall have been tested in accordance with LM-79 and LM-80.
- B. Fixtures, luminaires, etc. shall include all necessary mounting and connecting accessories.

SECTION 26 50 00 – LIGHTING

- C. Photocells shall be 120/208/277 volt, minimum 2000 watt, conduit mount, with diecast zinc housing with slider adjustable ON/OFF range. Tork 2100 series, or approved equal.
- D. Motion sensor wall switches shall be ultrasonic or passive infrared type, wall mounted, ivory colored, 120-277 volt, rated minimum 1200 watt, adjustable sensitivity, adjustable time delay, switch for manual control and vandal resistant hard lens. Buttons on the face of the switches shall operate in toggle mode to manually turn on/off connected lighting loads. Motion sensor switches shall be Watt-Stopper type WI-200 or Hubbell type LHMTS1 for single switch/level applications, or approved equal.

PART 3 - EXECUTION

3.01. LOCATIONS

- A. Locate light switches, etc. 6 inches from door casings (except on center in spaces less than 12 inches), 42 inches to centerline above finished floor.

3.02. MOUNTING AND SUPPORTS

- A. Fixtures, luminaires, etc. shall be installed plumb and true and shall be square with the adjacent walls, ceilings and structural members. The location of similar items shall be consistent.
- B. Fixtures, luminaires, etc. shall be accurately mounted and leveled and be firmly supported either directly or indirectly by a sound and safe structural member of the building in accordance with manufacturer's instructions, or as directed. Supports shall be neatly placed and properly fastened.
- C. Follow manufacturer's installation details wherever available. Provide all boxes, mountings, wiring or fittings required, standard or special.
- D. The Contractor shall touch-up paint all scratched, marred or damaged factory finish.

End of Section 26 50 00

SECTION 28 90 00 – PROCESS INSTRUMENTATION AND CONTROL

PART 1 - GENERAL

1.01 APPLICABLE PROVISIONS

- A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02 SUMMARY

- A. The requirements of this Section and the other Division 26 and 28 Sections apply to all the process control and instrumentation work.
- B. Coordinate process control and instrumentation work with related work shown and specified elsewhere.
- C. This section covers the work necessary for providing the design, supply, fabrication, configuration, testing, calibration, startup and Owner training for the Process Instrumentation and Control System (PICS). The PICS consists of control and telemetry system components, programmable logic controllers, communications networks, field instruments, control panel, system and application software, etc.; including all materials, cables, terminations, labor, equipment, devices, etc.
- D. Design, supply, fabrication, configuration, testing, calibration, startup and Owner training for the equipment, components and software provided under this section shall be provided by the PICS Supplier
- E. Interface with controls provided by other contractors or suppliers (e.g. pumps, engine-generator sets, automatic transfer switches), and the Owner shall be coordinated between the Contractor and the Owner.
- F. Provide all necessary equipment, devices, materials and appurtenances necessary for proper operation. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.
- G. Provide all software of the system to control pumps, monitor system operation and initiate alarms for a complete and integrated system.
- H. Provide all testing and training.
- I. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.
- J. Work not included: The following electrical system related work will be provided by the Owner, General Contractor or other Subcontractors:
 - 1. Owner: Programing and Integration of Control Panel into existing Owner SCADA system.
 - 2. General Contractor: Telemetry Control Panel (except installation by electrical contractor), Magnetic Flow Meter, Reservoir Level Transmitters and Float Switches, and intrusion limit switches as shown on the electrical plans and bid documents.

1.03 ALTERNATES

- A. Include electrical work associated with each alternate in the alternate bid price; except, below grade conduits and circuit breakers within panels shall be provided in the base bid.

1.04 EXISTING CONDITIONS

- A. Before submitting bid, examine existing site conditions to determine effect on execution of the electrical work and include costs in bid.

1.05 SPECIAL AREAS

- A. Not applicable.

1.06 QUALITY ASSURANCE

- A. PICS supplier and all testing, etc. of the PICS shall be Quality Controls Corporation (QCC), or approved equal, to match and integrate with the Owner's existing systems and equipment.
Contact:

Quality Controls Corporation
5015 208th St, Suite 1B
Lynnwood, WA 98036 James Cross
JamesC@Quality-controls.com
Tel: (425) 778-8280
Fax: (425) 778-4541

- B. PICS Control Panel manufacturer and panel manufacturer's personnel shall be experienced, thoroughly trained and completely familiar with custom control panels, programmable logic controllers and the Owner's requirements.
- C. PICS Control Panel shall be factory wired, tested and listed by Quality Controls Corporation, or approved equal, to match and integrate with the Owner's existing equipment.
- D. PICS supplier shall provide, terminate the fiber and Ethernet control cables and connectors.
- E. PICS supplier shall coordinate with the Owner regarding specific PCIS requirements.
- F. Responsibilities
 - 1. The Contractor, through the use of the System Integrator and qualified installers, shall be responsible to the Owner for the implementation of the PCIS and integration of the PCIS with other required instrumentation and control devices. The System Integrator shall furnish the PCIS equipment, materials, etc. complete to the Contractor for installation and connection. The Contractor shall be responsible for furnishing, installing and connecting all conduit, appurtenances, conductors, conductor terminations, mounting brackets and hardware in addition to installing and connecting instrumentation and all equipment listed in the Contract Documents.
 - 2. Due to the complexities associated with the interfacing of numerous control system devices, it is the intent of these specifications that the System Integrator be responsible to the Contractor for the integration of the PCIS with devices furnished under other sections with the objective of providing an integrated

control system free of signal incompatibilities, and completely operable and suitable for the purpose intended, as specified herein.

3. As a minimum, the System Integrator shall perform the following work to provide a complete and functioning system:
 - a. Prepare PCIS hardware submittals.
 - b. Design, develop, and electronically draft drawings and control panel designs.
 - c. Prepare the test plan, the training plan, and the spare parts submittals.
 - d. Provide equipment and software for the programmable logic controller (PLC) hardware and software.
 - e. Procure equipment for, fabricate, wire and test the control panel.
 - f. Perform factory tests on Control Panel, PLC, Panelview, and obtain the Owner's acceptance of the PCIS Work.
 - g. Test, start-up, etc. the motor starters, variable frequency drives, etc.
 - h. Perform alarm configuration programming.
 - i. Perform report generation programming.
 - j. Provide on-site services to commission the pump station control system.
 - k. Provide on-site engineer to conduct the performance test.
 - l. Prepare Operation & Maintenance Manuals.
 - m. Conduct training classes.
 - n. Provide record drawings, BOM, PLC Program, Display Program and SCADA file copies on USB Key to be stored at Job site.

1.07 SUBMITTALS

- A. Provide submittals for the following:
 1. Control Panels and all components.
 2. Panel wiring diagrams.
- B. Submit complete documentation for the process control and instrumentation equipment, devices, materials, etc. showing the model number, type, rating, size, style, manufacturer's names, and manufacturer's catalog data sheets for all items. Include data on features, rating, and performance.
- C. Prior to procurement, a full Bill of Materials listing all items supplied. Include at a minimum the Manufacturer, Model Number, Tag Number, Supplier, and Quantity.
- D. Provide schematic wiring and loop diagrams for all control systems and equipment (including control equipment, devices, etc. furnished with equipment provided by others); including all process control and instrumentation, security alarm devices, control panel, programmable logic controller (PLC), motor starters and variable frequency drives, etc. All components and their locations, tag numbers, etc. shall be indicated on the diagrams. Include wire numbers, terminal numbers and PLC I/O addresses, rack numbers and slot

numbers.

- E. Provide scaled arrangement drawings for the control panel showing front and internally mounted equipment, devices, instruments, etc.
- F. Provide detailed installation drawings for all process control and instrumentation, control devices, control panel, etc. Include necessary mounting brackets, accessories and other appurtenances required for the installation.
- G. Submittal drawings shall be on standard size sheets no larger than the contract drawings.
- H. Submittals shall provide sufficient detail so compliance with the drawings and specifications can be ascertained. Clearly identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and review materials and equipment. Obtain approval before purchasing. Items not in accordance with the drawings and specifications will be rejected.
- I. Forward all submittals to the Engineer, together, at one time, in bound folders with tabs and index for each section. Individual or incomplete submittals are not acceptable.
- J. The Contractor shall establish quantities, check drawings and data, verify space requirements, dimensions, and possible interferences prior to submittal.
- K. The Owner and Engineer will review each submittal, mark to indicate action taken, and return. Compliance with specified characteristics is the Contractor's responsibility. Approval of submittals does not release the Contractor from a proper installation, compliance with the drawings, specifications, codes, standards, etc. or coordination of the work.
- L. Deviations from approved submittals shall be re-submitted for approval prior to fabrication and/or installation.

1.08 RECORD DOCUMENTS

- A. Provide record documents at completion of the project in accordance with the submittal requirements listed elsewhere in these documents.
- B. All record documents in software form shall be provided on a single CD or thumb drive. Include the necessary program(s) to read control software, test results, etc. Separate submittals for the various disciplines will not be accepted.

1.09 "AS BUILT" DRAWINGS

- A. Provide "as built" drawings in accordance with the requirements listed elsewhere in these documents.
- B. Include any detailed equipment, raceway, wiring, etc. diagrams and layouts prepared by Contractor or his subcontractors, suppliers, etc.

1.010 OPERATION AND MAINTENANCE MANUALS

- A. Provide operation and maintenance manuals in accordance with the requirements listed elsewhere in these documents.

1.011 WARRANTY

- A. The complete installation shall be guaranteed for a period of one (1) year after date of project completion. For warranty purposes, the date of project completion shall be considered the date of final acceptance of the installation by the Owner certified in writing, and after Owner has received all project close-out requirements. All corrective work, if needed and requested by the Owner, shall be provided without cost to the Owner

during the guarantee period.

- B. All corrective work performed by the Contractor in remedying defective work during the guarantee period following the Owner's acceptance of the project shall be subject to the same guarantee requirements of the original work for a period as specified from the date of completion of the corrective work.
- C. Corrective work shall include on-site service by the Contractor, subcontractor, supplier, and/or nearest technical service representative of the equipment manufacturer. Service shall be provided within 24 hours from the time of request for warranty service by the Owner.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Coordinate the features of materials, equipment and Lake Whatcom Water and Sewer District regarding specific requirements so they form an integrated system.
- B. Contractor shall make certain that all materials selected by him, his subcontractors or by his suppliers, conform exactly to requirements of the drawings and specifications. Transmittal of such specifications and drawing information to subcontractors, person manufacturing and/or supplying materials to the project, and rigid adherence thereto, is the Contractor's responsibility.
- C. All equipment, devices, materials, etc. shall be UL (Underwriter's Laboratories Inc.) listed, labeled and approved for the service intended where UL standards have been established. If no UL label is available, the label of a testing agency or conformance to national standards recognized and approved by the electrical inspector having jurisdiction is required.
- D. All equipment, devices, materials, etc. shall be new and installed only if in first class condition.
- E. Unless otherwise indicated, provide materials and equipment which are the standard products of manufacturers regularly engaged in the production of such materials and equipment. Provide the manufacturer's latest standard design that conforms to these specifications.
- F. All equipment, devices, etc. and their components shall be designed for continuous duty without degradation of function or performance.
- G. In the event that any item is not available exactly as specified, the Contractor shall so notify the Owner and Engineer in writing prior to bidding as early as possible to allow ample time for an alternate item to be selected without delay to the project.

2.02 OPERATION

- A. See specific operational requirements listed on the civil drawings and specifications for set points, flow volumes, pressures, horsepower, pump sequencing, time of day operation, etc.
- B. The control system shall communicate information back to the Owner's existing SCADA system.
- C. Control system shall provide local indication on the front of the control panel via a graphical operator interface directly connected to the systems control processor. The operator interface shall provide system status, modification of set-points, and alarm

duties.

- D. The control system shall monitor the reservoir conditions and display these values on the operator interface. All inputs shall be shown on the display screens for operators to monitor.
- E. The control system shall monitor and forward the following conditions as alarms to the SCADA system.
 - 1. Utility Power Fail.
 - 2. UPS Common Alarm.
 - 3. Tank Hatch Intrusion (East & West Tank)
 - 4. Tank High Level Float Alarm (East & West Tank)
 - 5. Tank LIT High High Level- (East & West Tank)
 - 6. Tank LIT High Level- (East & West Tank)
 - 7. Tank LIT Low Level- (East & West Tank)
 - 8. Tank LIT Low Low Level- (East & West Tank)
 - 9. Tank LIT Fail- (East & West Tank)
 - 10. Access Ladder Intrusion (East & West Tank)
 - 11. Electrical Panel Intrusion
 - 12. Vault Intrusion (Outlet Vault East Tank, Outlet Vault West Tank, Flow Meter Vault)
 - 13. Reservoir Outlet Valve Fault
 - 14. Reservoir Outlet Valve Fail To Open
 - 15. Reservoir Outlet Valve Fail To Close
 - 16. Outlet Flow High High Level
 - 17. Outlet Flow High Level
 - 18. Operator In Trouble
 - 19. Telemetry Communication Fail
- F. The control system shall monitor and forward the following conditions as status to the SCADA system.
 - 1. Outlet Valve Position
 - 2. Reservoir Level (East and West Tank)
 - 3. Outlet Flow Rate
 - 4. Outlet Flow Totalizers (Daily, Monthly, Yearly, Historical)
 - 5. Rain Totalizers (Daily, Monthly, Yearly, Historical)
 - 6. Utility Power Status
 - 7. UPS Status
 - 8. UPS Alarm
 - 9. UPS Buffering

10. Operator in trouble
 11. Intrusion
- G. The operator interface shall display all of the above items and the following:
1. Alarm Banner
 2. Alarm History with time/date stamp, last 100 events
 3. Communication Status

2.03 PANEL ENCLOSURE & COMPONENTS

- A. Electrical equipment enclosure shall be a heavy-duty galvanized steel frame housing, NEMA 12, wall mounted, with hinged door, and interior support channels for mounting equipment. Doors shall be gasketed overlapping type with 3 point latching mechanism and padlockable handle. Surface finish shall be a rust inhibiting primer followed by an epoxy or polyurethane polyester top coat.
- B. All incoming and outgoing wiring shall terminate on marked, channel mounted, heavy-duty tubular screw type terminal blocks.
- C. Provide molded plastic wireways inside control panel for all wiring within the panel. Wireways shall have slotted sides and removable covers.
- D. Panel and all components within and on the face of the panel shall be identified with laminated plastic nameplates, black face, white core, engraved with minimum ¼ inch letters describing its function.
- E. Panel shall be sized as required.
- F. All components shall be pre-wired to the maximum extent possible.
- G. See drawings for panel components/devices make and model numbers.

2.04 PROGRAMMABLE LOGIC CONTROLLER

- A. Programmable logic controllers (PLC's) shall be an Allen Bradley CompactLogix, complete with Allen-Bradley color operator terminal, 10" touch screen, to match and integrate with Owner's existing systems and equipment. No substitutions.
- B. Controller shall be modular style, rail mounted, and include a processor, power supplies, memory, base, racks, cables, and all other components for a complete and operational system. Input/output modules shall be provided as required to provide the functions desired, except type and minimum quantity as indicated.
- C. CPU shall provide sufficient memory, speed, inputs, outputs, etc. to operate the pump station; plus be able to be remotely controlled and monitored from the Owner's system. Operational data shall be stored in non-volatile EEPROM and the unit shall restart automatically after a power failure without operator assistance.
- D. Programmable controller shall be programmable from either a personal computer using Ethernet or USB.
- E. The programmable controller shall be initially programmed by the panel supplier in accordance with the schematic diagrams and the requirements of the Engineer and the Owner. After initial programming, the program shall be revised if required during installation of the system and its testing, without additional cost to the Owner. After acceptance and completion of revisions and re-programming, provide the Owner with a backup of the program, program documentation, rung comments, software, etc. consistent

with Owner's ladder logic format (function block format is not acceptable), to enable reloading at any time.

- F. Programmable logic controller shall be mounted in the control panel enclosure, with the Operator interface terminal mounted in the door of the control panel enclosure.

2.05 APPLICATION SOFTWARE

A. Operator Interface Terminal

1. Provide HMI graphic screens, trending and alarm handling.
2. Configuration shall allow District personnel to view and control the pumping system.
3. Display navigation, color conventions, symbols, etc. shall be consistent with that currently in use with the Owner's system.
4. Use of pop-up screens consistent with those currently in use with the Owner's system.

B. Software:

1. Provide Owner with finalized PLC offline program via USB offline copy when complete.

2.06 RELAYS

- A. Control and timing relays shall be minimum 300 volt rated, electrically operated, with 110 volt AC or 24 volt DC (as required) holding coil and the quantity of 10 amp AC and 5 amp DC rated convertible contacts required. Relays shall have an 8 pin octal base and matching socket. The relays shall be Allen-Bradley 700HA series or approved equal.
- B. Power failure relay shall be a solid state phase unbalance, sequence and loss monitor relay, automatic reset, field adjustable response delay and minimum of 1 double pole-double throw output contact rated a minimum of 10 amps at 120 volts. Diversified Electronics SLA series, or approved equal.

2.07 CONTROL AND INDICATING DEVICES

- A. Pushbuttons, selector switches, potentiometers, indicating lights, etc. shall be heavy-duty oil-tight type. Contacts shall be rated minimum 10 amp AC and DC continuous. Indicating lights shall be provided with the lens color indicated. 120 volt (and higher) indicating lights shall be transformer type. Control devices shall be Allen-Bradley Bulletin 800T or approved equal.
- B. Each device shall have a suitable legend plate.

2.08 TERMINAL BLOCKS

- A. Provide terminal blocks for termination of all wiring leaving or entering panel, and all wiring extending from the interior of the panel to cover mounted devices, plus minimum 20% installed spare.
- B. Terminal blocks shall be 600 volt rated, DIN rail mounted, compression screw clamp type with current bar providing direct contact with wire and yoke.
- C. Fused terminal blocks shall have integral blown fuse LED indicator.
- D. Terminal blocks shall be suitably labeled.

2.09 FUSES

- A. Provide minimum 2 spare fuses for each type, rating, etc. of fuse used.

2.010 CONTROL PANEL WIRE AND CABLE

- A. Line voltage (120 volt AC) control cable shall be single conductor stranded copper with 600 volt type SIS cross-linked polyethylene insulation. The minimum conductor size shall be #14 AWG. Color codes shall be as follows:
 - 1. Line power: Black.
 - 2. Switched power: Red.
 - 3. Neutral: White.
 - 4. Ground: Green.
- B. Low voltage (24 volt DC) control cable shall be single conductor stranded copper with 600 volt type TFFN or MTW insulation. The minimum conductor size shall be #16 AWG. Color codes shall be as follows:
 - 1. Positive: Blue.
 - 2. Neutral: Blue/White.
 - 3. Ground: Green/Yellow.
- C. Instrument cable, unless otherwise required by the particular instrument, shall be multi-conductor solid copper with 600 volt PVC insulation, 100% aluminum polyester shield, stranded copper drain wire, and an overall PVC jacket. The minimum conductor size shall be #16 AWG. Color codes shall be as follows:
 - 1. Positive: Black.
 - 2. Negative: White.
- D. See specification section 26 05 00 for field motor circuit cable, branch circuit cable, control circuit cable, etc.

2.011 EQUIPMENT IDENTIFICATION

- A. Provide nameplates for all equipment and other devices used for the control of circuits, equipment, etc.
 - 1. Control panels, and each device within each.
 - 2. Meters, control devices and indicating lights.
- B. Nameplates shall include its identification number and adequately describe the function or operation of the identified equipment, devices, etc. and, if applicable, include the panel and circuit number(s) from which it is fed.
- C. Relays, power supplies, terminal blocks and other components located inside panels, etc. shall be labeled with its identification number consistent with the project documents, schematic wiring diagrams, etc. and adequately describe its function or operation.
- D. Nameplates, labels, etc. shall be consistent with the project documents. Submit proposed inscriptions for approval.

PART 3 - EXECUTION

3.01 GENERAL

- A. Contractor and their personnel shall be experienced, thoroughly trained and completely familiar with control systems equipment, devices, materials, etc. and the required methods of installation.
- B. The installation shall be done in a neat and workmanlike manner and shall be suitable for the location, in accordance with the requirements listed elsewhere in these documents.
- C. Provide on-site services to commission the pump station control system.

3.02 PRODUCT HANDLING

- A. After completion of shop assembly, factory test, and approval, all equipment, cabinets, panels, and consoles shall be packed in protective crates and enclosed in heavy duty polyethylene envelopes or secured sheeting to provide complete protection from damage, dust, and moisture. Dehumidifiers shall be placed inside the polyethylene coverings. Boxed weight shall be shown on shipping tags together with instructions for unloading, transporting, storing, and handling at the job site.
- B. Special instructions for proper field handling, storage, and installation required by the Manufacturer shall be securely attached to each piece of equipment prior to packaging and shipment.
- C. Each component shall be tagged to identify it on the outside of the package.

3.03 LOCATIONS

- A. The mounting heights and location of similar equipment and devices shall be consistent, in accordance with the requirements of the ADA where applicable. Special purpose items shall be located conveniently for the purpose intended.
- B. Disconnect switches, circuit breakers, etc. shall, in no case, be installed so that the grip of the operating handle, when in its highest position, is more than 6¹/₂ feet above the floor or working platform.
- C. All equipment shall be located and installed so that it shall be readily accessible for operation and maintenance. Where job conditions require reasonable changes in approximated locations and arrangements, or when the Owner exercises the right to require changes in location of equipment which do not impact material quantities or cause material rework, the Contractor shall make such changes without additional cost to the Owner.
- D. Prior to rough-in, the Contractor shall mark or otherwise show the location of all equipment and devices, and obtain specific approval from the Owner and Engineer for the location of each prior to installing enclosures, boxes, raceways, etc.

3.04 EQUIPMENT AND DEVICES

- A. Equipment, devices, enclosures, etc. shall be installed plumb and true and shall be square with the adjacent walls, ceilings and structural members.
- B. Equipment, cabinets, boxes, etc. shall be accurately mounted and leveled and be firmly supported either directly or indirectly by a sound and safe structural member of the building in accordance with manufacturer's instructions, or as directed. Supports shall be neatly placed and properly fastened.

- C. The correct lifting, jacking and/or moving gear which shall prevent damage to the equipment shall be used.
- D. Bolts, nuts, screws and other fastenings shall be tightened and all covers replaced on equipment and boxes. Electrical connections, particularly those on bus work in panelboards, etc. shall be checked to ensure tightness and electrical conductivity. Gaskets, seals, etc. shall be checked for proper fit.
- E. Follow manufacturer's installation details wherever available. Provide supports, boxes, mountings, wiring, fittings, etc. as required, standard or special. Wherever any conflict arises between manufacturer's instructions, codes and regulations, and these Contract Documents, follow Owner's decision.
- F. Brace all equipment, etc. as required to meet the requirements of the International Building Code.
- G. Attach to wood with wood or lag screws, to metal with machine screws or bolts and to concrete with carbon steel wedge or sleeve type expansion anchors or self-drilling metal anchors and machine screws or bolts.
- H. Pad and floor mounted equipment shall be secured with suitable hot dipped galvanized steel anchor bolts, washers, hex nuts, etc.
- I. The Contractor shall touch-up paint all scratched, marred or damaged factory finish on equipment, devices, enclosures, etc.

3.05 SUPPORTS

- A. Provide all necessary supports, anchors, fasteners, and backing for all boxes, enclosures, equipment and devices in accordance with the requirements listed elsewhere in these documents.

3.06 WIRES AND CABLES

- A. All cable shall be run in raceways. "Open" cable wiring is not allowed.

3.07 CALIBRATION

- A. The Contractor and/or control system supplier shall calibrate all components of the control system after completion of the installation. Each component shall be adjusted to the required range for the specific application, and the results recorded. Include records in the O & M Manuals.
- B. Components that cannot be calibrated or that are found to exceed the required range and accuracy in the opinion of the Owner and/or Engineer; the item shall be replaced or suitably repaired to the approval of the Owner and Engineer, and the test repeated without additional cost to the Owner.
- C. The Owner's and/or Engineer's decisions shall be final regarding the acceptability and completeness of the installation and associated calibration.

3.08 FACTORY TESTING

- A. Prior to delivery to the site, the control systems shall be assembled and tested by the controls supplier. All equipment, devices, motor controllers, variable frequency drives, etc. shall be operated and the systems shall be powered with rated voltage for a minimum of 3 days. The control systems shall be interconnected as they will be installed in the field. If actual equipment and devices are not available, simulation equipment shall be provided to fully demonstrate the functionality and proper control and operation of the equipment, devices, hardware and software; including all intended modes and sequences

of operation.

- B. Following the control system supplier testing, the system shall be tested by the Owner, Engineer and/or Contractor prior to shipment to the site. The testing shall include, but not be limited to, the operation of all input and output points, control equipment and devices, motor controllers, variable frequency drives, etc. and the demonstration of all control and operating functions.
- C. Control systems supplier shall revise, modify, adjust, etc. the system as directed by the Owner and/or Engineer during the testing period.
- D. Control systems supplier shall inform and coordinate the time of testing a minimum of 4 weeks prior to the testing date.

3.09 FIELD TESTING

- A. The Contractor shall perform initial checks of all systems prior to testing. Conduct final testing of equipment installation, operation, communications, failure modes and transitions, remote indication and function, report generation, remote access and alarming with Owner and Engineer, to their satisfaction.
- B. All testing shall be performed by personnel that are trained in the specific task to be performed. Assistance by manufacturer's representative with testing shall be provided if requested by the Owner and/or Engineer without increase in contract sum.
- C. After the installation is completed, the Contractor and control systems supplier shall test the operation of the systems and all equipment, devices, hardware and software; including all intended modes and sequences of operation.
- D. Contractor and control systems supplier shall inform and coordinate the time of testing a minimum of 4 weeks prior to the testing date.
- E. Following the Contractor and control systems supplier testing, the systems will be tested by the Owner and Engineer. During this testing, the Contractor and control systems supplier shall be available for assistance during testing upon the Owner's and/or Engineer's request. The Owner and/or Engineer reserve the right to request their suppliers, etc. to also actively participate in the testing.
- F. Contractor and control systems supplier shall revise, modify, adjust, etc. the system as directed by the Owner and/or Engineer during the testing period.
- G. Any deficiencies in the system installation found during testing shall be corrected promptly by the Contractor and control systems supplier at no additional cost to the Owner.

3.010 START-UP

- A. After the installation is completed, the Contractor and PICS supplier shall start up and test all equipment and systems for functional operation, including all intended modes and sequences of operation.
- B. Following the Contractor and PICS supplier testing and start-up, the systems will be tested by the Owner and Engineer. During this testing, the Contractor and PICS supplier shall be available for assistance during testing upon the Owner's and/or Engineer's request. The Owner and/or Engineer reserve the right to request their suppliers, etc. to also actively participate in the testing.

3.011 TRAINING/INSTRUCTION AND ASSISTANCE

- A. In addition to training/instruction and assistance required in other sections of these documents, after the installation is complete and operating, and prior to acceptance of the work, conduct owner training/instruction periods at the site for the PICS; including, but not limited to:
 - 1. Equipment and control systems operation.
 - 2. Preventive maintenance procedures.
 - 3. Trouble shooting.
 - 4. Calibration.
 - 5. Testing.
 - 6. Replacement of components.
- B. The person(s) who conduct these instructions and demonstrations shall be a qualified representative(s) of the manufacturer with substantial training and operating experience on this equipment and project, and shall be versed in the operating theory as well as practical operation and maintenance work. Instructor(s) shall have the necessary educational and interpersonal skills, as well as proven ability to effectively perform the training. Their qualifications shall be submitted to the Owner before conducting the instruction period.
- C. Each period shall include preliminary discussion and presentation of information using the actual maintenance manuals required for this project. Contractor shall notify Owner and Engineer at least 48 hours in advance of readiness to conduct the instruction period. The actual time and date of instruction period shall be acceptable to the Owner and Engineer.
- D. All training material shall be furnished and supplied by the Contractor.

3.012 ACCEPTANCE

- A. For the purpose of this Section, the following conditions shall be fulfilled before the WORK is considered substantially complete:
 - 1. All submittals have been completed and approved.
 - 2. The PCIS has been calibrated, loop tested and pre-commissioned
 - 3. The performance test has been successfully completed.
 - 4. All punch-list items have been corrected.
 - 5. All record drawings in both hard copy and electronic format have been submitted.
 - 6. Revisions to the Owner's Manuals that may have resulted from the field tests have been made and reviewed.
 - 7. All debris associated with installation of controls and instrumentation has been removed.
 - 8. All probes, elements, transmitters and enclosures have been cleaned and are in like-new condition.

SECTION 28 90 00 – CERTIFICATION PAGE

SECTION 28 90 00 – CERTIFICATION PAGE

Controls Engineer Professional Certification: I hereby certify that Division 28 90 00 of this specification was prepared by me or under my direct supervision and that I am a duly registered Engineer in the State of Washington. My stamp applies to the section below:

Division – Section 28 90 00 Process Instrumentation & Controls



Quality Controls Corporation
5015 208th St SW, Suite 1B
Lynnwood, WA 98036
Phone: 425-778-8280

END OF SECTION

SECTION 31 10 00 – SITE CLEARING

PART 1. GENERAL

1.01 DESCRIPTION

- A. Work under this Section includes providing all labor, materials, tools, and equipment necessary for clearing, grubbing, removing and disposing of all trees, vegetation, and debris. Prior to the start of clearing and grubbing, the Contractor shall clearly mark any clearing limits and install any erosion control measures as shown on the Plans.
- B. Note that trees to be removed from the site have been previously felled by others ahead of this site clearing work.

1.02 RELATED SECTIONS

- A. Section 31 13 17 Tree and Shrub Protection
- B. Section 31 32 11 Soil Surface Erosion Control.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION

3.01 CLEARING AND GRUBBING

- A. The Contractor shall clear the entire area within the project limits by clearing and grubbing all vegetation to a minimum of 1-foot below the graded surface as shown on the Plans, including trees and stumps.
- B. All previously felled trees to be fully removed, as shown on the Plans, shall be limbed and trunks/logs cut to 25-ft lengths, or as directed by the District and property owner. Limbs shall be chipped and stockpiled on-site as needed for later site restoration. All logs shall be delivered to and stacked at the location near the entrance to Camp Firwood as directed by the District and the property owner.
- C. Remove all stumps in the area to be graded, as shown on the Plans.
- D. Tree stumps and standing trunks within select danger tree areas (outside of graded areas) shall remain, as shown on the Plans.
- E. All tree root wads, stumps, limbs and associated brush shall be removed from the site by the Contractor.
- F. Contractor shall exercise care as to not encroach or disturb vegetation outside of the marked clearing limits.
- G. Vegetation and debris must be hauled to a legal waste site obtained by the Contractor. All costs associated with disposing of grubbed vegetation and debris shall be incidental to the contract.

*****END OF SECTION*****

SECTION 31 13 17 – TREE AND SHRUB PROTECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes administrative and procedural requirements for the protection of trees, shrubs, and plant material not designated for removal. Such trees, shrubs, and plant materials shall be left in place and protected from damage or injury by the Contractor during construction using full and adequate methods of protection.

1.02 RELATED SECTIONS

- A. Specification sections that directly relate to the work of this section include the following:

Section 01 33 00	Submittal Procedures
Section 01 44 00	Quality Assurance Quality Control
Section 01 56 00	Temporary Barriers Enclosures Controls
Section 31 10 00	Site Clearing
Section 31 20 00	Earth Moving
Section 31 23 33	Trenching and Backfill

1.03 DEFINITIONS

- A. CRITICAL ROOT ZONE – A circular perimeter around the base of a tree that defines the area of root structure that may cause significant damage to the vitality of the tree if damaged.
- B. INTERNAL CRITICAL ROOT ZONE – A concentric circular perimeter within the Critical Root Zone that defines the area of root structure that may cause the tree to die if significantly damaged.

PART 2 - PRODUCTS

2.01 NOT USED

PART 3 - EXECUTION

3.01 PROTECTION WITHIN THE CRITICAL ROOT ZONE (CRZ)

- A. Where existing trees are within the area of work, or where existing trees outside the area of work have the CRZ extending into the area of work, the Contractor shall employ all methods to minimize adverse impact to these existing trees including limbs and roots. The Contractor shall notify the Owner's Representative of any construction work within the CRZ of trees at least one (1) Working Day before the scheduled activity. These methods may include but not be limited to:
 - 1. Temporary chain link construction fencing.

2. Temporary tie-up of low limbs.
 3. Application of a 4- to 6-inch thick layer of mulch (or wood chips salvaged from clearing and grubbing operations) within the drip-line of trees.
 4. Timber or steel planking for protection of surface roots from Equipment.
 5. Tree root pruning or other tree root treatment as directed by the Owner.
- B. No roots over 2 inches shall be damaged. If roots exceeding 2 inches exist, trenching or other earth work shall be carried out as required to avoid damaging roots exceeding 2 inches, which may include but shall not be limited to hydro-excavation or hand digging.
 - C. Tree roots smaller than 2-inches in diameter shall be cleanly cut flush with the edge of the trench or tunnel.
 - D. Ripping or tearing of tree roots will not be allowed.
 - E. No parking, storage, dumping or burning shall be permitted.
 - F. Silt fence installed within the CRZ shall be folded under and anchored with gravel or soil. Silt fence shall not be trenched into the soil.
 - G. No storage of equipment or materials shall be allowed within the CRZ of trees not designated for removal. Steel planking, or timber planking made of 4-inch thick material, each plank covering a minimum of 8 square feet, shall be used to support backhoe and other Equipment stabilizers when set within the CRZ of a tree.

3.02 PROTECTION WITHIN THE INTERNAL CRITICAL ROOT ZONE (ICRZ)

- A. All requirements as listed under 3.01 shall be followed.

3.03 ABOVE GRADE WORK

- A. Tree removal or tree trimming within 10 feet of any overhead utility line requires the Contractor to make the notification to the Owner.
- B. When the Contractor anticipates construction operations that will unavoidably affect tree limbs, the Contractor shall notify the Owner at least five (5) Working Days in advance of commencing such operations.
 1. Before trimming any trees, the Contractor shall notify the Owner of the proposed method and the amount of trimming required.
 2. Trimming shall be done in accordance with National Arborist Association tree-pruning standards.

*****END OF SECTION*****

SECTION 31 20 00 – EARTH MOVING

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Work includes but is not limited to following:
 - 1. Excavating, filling, placing, compacting, dewatering, and final site grading as specified herein and as shown on the drawings.
 - 2. Removing materials from site, which are either not accepted for use or are in excess of that needed.
 - 3. Importing any additional required material.
 - 4. Excavation shoring and stabilization.
 - 5. Section excludes trenching and backfill covered in Section 31 23 33.

1.02 EARTHWORK SUMMARY

- A. This section includes all work related to providing temporary support and protection for excavations to safeguard public health, protect workers, protect existing improvements and insure the safe prosecution of the work. The Contractor may elect to employ any combination of shoring, tunneling, boring, sliding trench shield, or other means to complete the work.
- B. The Contractor shall provide all equipment, material, labor and design services necessary to develop and maintain adequate excavation support and protection. The Contractor shall determine the need for and adequacy of excavation support and protection requirements.
- C. The Contractor shall be solely responsible for any excavation support and protection or trench safety systems employed on the project. In no way shall the Owner assume any responsibility for the protection of life or property implied by the use of such systems.
- D. Excavations, embankment, and backfill for vaults, access roads, structures, and appurtenances to be constructed on firm native soil in excavation areas and compacted Structural Fill in embankment areas.
- E. Final grading and subgrade & surface preparation for fill in forested areas shall be in accordance with the Plans and Section 32 93 00 Forest Restoration.
- F. Unsuitable Material, as defined below, shall be hauled to a dumpsite secured by the Contractor and included in the cost of excavation Overexcavation unit price as listed on the Bid Proposal.

1.03 SUBMITTALS

- A. Submit in accordance with requirements of Section 01 33 00 and the following:
 - 1. Gradation and moisture density curves for all imported materials.
 - 2. Gradation and moisture density curves for all processed onsite materials for use as a substitute for imported materials.
 - 3. Separation Geotextile product information, if applicable.

1.04 QUALITY ASSURANCE

- A. Manufacturer/Installer shall be a Specialist.

- B. The Contractor shall comply with and give notices required by all federal, state, and local laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither the Owner nor Engineer or their staff will be responsible for monitoring Contractor's compliance with Laws and Regulations.
- C. Per WSDOT Standard Specifications, Section 2-09.3(1) — General Requirements, "All structure excavation, trenching, and shoring shall be performed in strict compliance with WAC 296-155 as well as all other applicable local, Contracting Agency, and Federal laws and regulations."

1.05 JOB CONDITIONS

- A. Existing Conditions:
 - 1. The Contractor shall examine the site before commencing work and shall make his own deductions and conclusions as to the nature of materials to be encountered and difficulties anticipated.
 - 2. Contractors shall make whatever investigations as are necessary to determine what measures are necessary to successfully complete the work in accordance with the Contract. The Contractor shall include in the Contract price all work necessary to perform the tasks required to complete the Work as indicated on the Plans and specified herein: including, but not limited to, sheeting, shoring, dewatering, stabilizing slopes, and any other work of temporary nature not a part of the permanent finished structure, lines, and grade. The Contractor's bid price shall include all costs associated with providing materials and methods such as selected by the Contractor to construct the improvements as shown on the plans.

PART 2. PRODUCTS

2.01 GRAVEL BACKFILL:

- A. Imported granular fill material placed under private roadways shall be sandy gravel or gravelly sand meeting WSDOT Standard Specification Bank Run Gravel 9-03.19.
- B. Imported granular fill material placed under SVCA roadways shall be WSDOT 9-03.9(3) Crushed Surfacing Top Course.

2.02 STRUCTURAL FILL

- A. For areas outside of the water tank footprint:
 - 1. Dry weather conditions: WSDOT 9-03.14(3) Common Borrow.
 - 2. Wet weather conditions: WSDOT 9-03.14(1) Gravel Borrow.
- B. Below the water tank: WSDOT 9-03.9(3) Crushed Surfacing Base Course. Shall extend out beyond the edge of the foundation a minimum of 1 foot at a 1H:1V.
- C. Below vault structures: WSDOT 9-03.9(3) Crushed Surfacing Base Course. Shall extend out beyond the edge of the vault bottom at a 1H:1V.
- D. Placed to surround collector pipe and placed behind below grade walls: WSDOT 9-03.12(4) Gravel Backfill for Drains.

2.03 REUSE OF EXCAVATED SANDSTONE

- A. Excavated sandstone from the site can be used for fill and grading on site outside of the

water tank footprint when prepared and placed in accordance with the Geotechnical Report Section 4.7.6.3.

- B. Excavated sandstone from the site proposed for use as the final gravel surfacing around the tank site shall conform with WSDOT 9-03.9(3) CSBC requirements.

2.04 UNSUITABLE MATERIALS:

- A. Unsuitable materials shall be those defined as containing vegetative matter, sludge, peat, sod, mulch, rubbish, pavement fragments, concrete fragments, and materials, which are excessively fine or coarse not allowing adequate compaction. All Unsuitable Material shall be disposed of offsite at a dumpsite secured by the Contractor.

2.05 GEOTEXTILE MATERIALS

- A. None anticipated, if determined to be required by the Geotechnical Engineer during construction:
 - 1. Stabilization Geotextile – Woven per WSDOT Standard Specification 9-33.2(1), Table 3 for soil stabilization.
- B. Other specific geotextile materials for other uses as shown on the Plans or other specific specification sections.

PART 3. EXECUTION

3.01 PROTECTION AND GENERAL REQUIREMENTS

- A. Temporary Erosion and Sedimentation Control: In accordance with Plans.
- B. Construction Traffic: Some onsite soils may be susceptible to disturbance when wet due to high silt/clay content. Contractor shall minimize traffic over any prepared subgrade.
- C. Utilities: Protect private and public utilities from damage in accordance with WSDOT Standard Specification 1-07.17.
- D. Pavement: Protect all pavement or paved areas intended to remain from damage.
- E. Access Streets and Roadways: Contractor shall keep all public and private roads free from gravel, dirt, and sediment. Provide wheel cleaning stations to clean wheels and undercarriage of trucks before leaving site as necessary to prevent dirt from being carried onto private or public roads. If roads are fouled, Contractor shall immediately clean in conformance with governing requirements and regulations.
- F. Shoring and Sheet piling: Provide shoring, bracing, cribbing, underpinning and/or sheet piling where required. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace, as required, to prevent cave-ins. Remove prior to backfilling unless otherwise specified
- G. Weather Limitations: Construction shall progress only when weather conditions will not adversely affect the quality of the finished work. Soils that are not compactable due to saturation shall be aerated or removed and replaced with a compactable material. Contractor shall bear all costs for rework caused by weather conditions.
- H. Dewatering: The Contractor shall furnish, install and operate all necessary machinery and equipment necessary to keep excavations and earth embankments reasonably free from water during construction. Excavation shall be kept dry and water shall be disposed of so as not to cause injury to public, damages to adjacent property or to cause a nuisance or menace to the public. Water shall be removed to prevent softening of foundation bottoms,

undercutting of foundations causing changes in soil conditions which will be detrimental to stability of subgrades and foundations. The Contractor shall establish and maintain positive drainage away from excavations via temporary drainage ditches, pumping, or other diversions outside of excavation's limits.

- I. Water for Compaction. Contractor shall provide all water as necessary to moisture-condition Structural Fill material to achieve required compaction densities.

3.02 EXCAVATION

A. Excavation - General.

1. Excavate to contours and dimensions indicated taking into account design depths of finish surfacing (such as asphalt pavement, cement concrete pavement, sidewalks, topsoil, etc.)
2. Remove all Unsuitable Material from the project site.
3. Keep excavations free from water while construction is in progress.
4. Notify the Engineer immediately in writing in the event that it becomes necessary to identify and remove material defined as unsuitable to a depth greater than indicated.
5. Refill excavations with Structural Fill to the depth indicated.
6. All excavated material not utilized onsite to be hauled to a legal disposal site at the contractor's expense and to be included in the base bid.

B. Overexcavation

1. In the event the unsuitable soils are encountered, the Engineer will make a decision in the field whether those soils will be excavated and replaced with Structural Fill. An increase or decrease in the Base Bid will be made using the Unit Prices as listed on the Bid Proposal for Over-excavation and Structural Fill.
2. Excavate to depths only as authorized and directed by the Civil Engineer and/or Geotechnical Engineer. Work required to remedy over excavation not authorized by the Owner or the Engineer shall be at the Contractor's expense.

C. Excavation for Structures. Includes roads and vaults and reservoirs (coordinate with other applicable Sections and Drawings).

1. Excavate to depth indicated.
2. If excavation is deeper than indicated, fill with Structural Fill as appropriate for type of installation prior to placement of improvements.
3. Grade exposed subgrade away from improvement work areas to avoid accumulation of water.
 - a. Proof Roll Subgrade.
4. Bearing Surfaces: If applicable, coordinate excavations with concrete placement schedule so that concrete will be placed on dry, solid trench bottoms. Bearing surfaces shall be undisturbed, level and true, free from moisture or frost.

3.03 SUBGRADE PROOF ROLLING

- A. If directed by the Owner or Engineer, perform proof roll in the presence of the Owner or Engineer, or the Owner's selected independent Geotechnical Engineer if applicable. If

applicable, Notify the Geotechnical Engineer 3 days prior to proof rolling.

1. After removal of Top Organic Soil, and upon reaching the firm native soil, proof roll the existing subgrade with six passes of a minimum 15-ton pneumatic-tired roller or loaded dump truck. Operate the roller in a systematic manner to assure number of passes over all areas, and at speeds between 2.5 and 3.5 miles per hour.
2. Rutting or pumping shall indicate unsatisfactory material and that material shall be excavated as directed by the Owner, Engineer, or Geotechnical Engineer (if applicable) and replaced with Structural Fill.
3. Perform proof rolling only when weather conditions permit. Do not proof roll wet or saturated subgrades. Materials degraded by proof rolling a wet or saturated subgrade shall be replaced by the Contractor as directed by the Owner, Engineer, or Geotechnical Engineer (if applicable) at no cost to the Owner.

3.04 STRUCTURAL FILL

A. General.

1. Fill shall be placed only on firm subgrade which has been proof-rolled and approved to receive fill by the Geotechnical Engineer.
2. Where subgrade or layer of the material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or to layer of material, to prevent free water appearing on surface during or subsequent to compaction operations. Remove and replace, or scarify and air dry soil that is too wet to permit compaction to required density. Material that has been removed due to excessive moisture may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing or pulverizing until moisture content is reduced to satisfactory value.
3. Structural fill materials are to be placed in uniform lifts as described in WSDOT 2-03.3(14)C Compacting Earth Embankments Method C.
4. Maintain construction areas as a continuous working surface throughout the project. Fill surfaces are to be graded smooth and sealed at the end of each work day to prevent ponding of water. After periods of rain, remove any soft material prior to placement of additional fill.
5. If applicable, provide cut and fill slopes reasonable true to line and grade with a tolerance of plus or minus 3 inches.

3.05 COMPACTION

A. Compact material to not less than the following percentages of maximum density in accordance with ASTM D1557, Methods A through D.

1. Structures, pavements, traffic areas. Each layer shall be placed in lifts not exceeding 8" (loose thickness) and compacted to 95% maximum dry density.
2. Planting and landscape areas. Each layer shall be placed in lifts not exceeding 8 inches (loose thickness) and compacted to 90% maximum dry density.

3.06 GRADING

A. General. Uniformly grade areas within limits of project site including adjacent transition areas. Smooth finished surfaces within specified tolerances, compact with uniform levels or slopes between points where finish elevations are shown or between points where finish elevations are shown or between such points and existing grades. In areas to be top soiled

or otherwise naturally restored, make allowances in site grading for placement of top soil and restoration improvements.

- B. Drainage Ditches. Finish ditches to ensure proper flow and positive drainage. Conduct final rolling operations to produce a hard, uniform and smooth cross-section.
- C. Subgrade beneath Structures and Pavements. Grade smooth and even, free of voids, compacted as specified and to required elevation.

3.07 INSPECTIONS AND TESTS

- A. Field inspections and tests may be conducted by the Owner as deemed necessary. The Contractor shall not interfere with such testing and shall make right to the satisfaction of the Engineer all work found to be deficient in meeting the specifications. If the subgrade or fills which have been placed are below the specified density, additional compaction and testing will be required until satisfactory results are obtained. The results of density tests of soil-in-place will be considered satisfactory if the average of any 4 consecutive density tests which may be selected is in each instance equal to or greater than the specified density, and if not more than 1 density test out of 5 has a value more than 2% below the required density. Testing and inspection by the Owner does not relieve the Contractor from the responsibility to provide adequate quality control measures to ensure the quality of his own work.

3.08 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Excess material shall be disposed of offsite. The Contractor is solely responsible for all costs, permitting, arrangements, and approvals associated with said offsite disposal.

*****END OF SECTION*****

SECTION 31 23 33 – TRENCH EXCAVATION AND BACKFILL

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Work includes but is not limited to following:
 - 1. Trenching, unsuitable trench bottom overexcavation, bedding, backfilling, compacting and disposal of excess materials as required for installation of all underground utilities, conduit and other miscellaneous structures.
 - 2. Providing all material, equipment and labor necessary to complete the excavation and backfill operations necessary to install the underground utilities depicted on the plans.
 - 3. Trench dewatering and pumping as needed.

1.02 RELATED SECTIONS

- A. Related work specified elsewhere, including but not limited to following:
 - 1. Section 01 44 00 Quality Assurance / Quality Control
 - 2. Section 31 20 00 Earth Moving
 - 3. Section 31 32 11 Soil Surface Erosion Control
 - 4. Section 31 50 00 Excavation Support and Protection
 - 5. Section 33 05 00 Common Works Results for Utilities
 - 6. Section 33 05 63 Precast Concrete Utility Structures
 - 7. Section 33 10 00 Potable Water Systems
 - 8. Section 33 16 33 Concrete Water Reservoirs
 - 9. Section 33 35 00 Gravity Sewer Piping
 - 10. Section 33 41 00 Storm Utility Drainage Piping

1.03 REFERENCES

- A. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, Latest Edition; Section 7-08 - General Pipe Installation Requirements, 7-09 Water Mains, 7-17 Sanitary Sewers, 7-01 Drains, 7-04 Storm Sewers, and other related sections.
- B. Washington State Department of Ecology's Stormwater Management Manual for Western Washington.
- C. Lake Whatcom Water and Sewer District Design and Construction Standards, February 23, 2022 or latest edition.

1.04 SUBMITTALS PRIOR TO CONSTRUCTION

- A. Erosion Control Products
- B. Pipe Bedding aggregate materials
- C. Trench Backfill aggregate materials
- D. Control Density Fill (CDF)

1.05 SYSTEM DESCRIPTION

- A. Provide protection of existing utilities affected by the work and make every effort to minimize disruptions to all utility services.
- B. If, during the course of construction, excavation interrupts traffic for longer than 15 minutes, inform the Owner and make all necessary arrangements for ingress and egress. In the event of such road closures, the Contractor shall be solely responsible for all traffic control measures including but not limited to flagging, barricades and cones.
- C. Trenches shall be closed or covered with steel plates at the end of each work day.

1.06 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with the requirements of all applicable regulatory agencies having jurisdiction.
- B. Testing and Inspection.

Contractor will provide testing and inspection by independent testing and inspection agency which will perform the following tasks:

 - 1. Gradation analysis for bedding and backfill material.
 - 2. Compaction and Moisture Control Tests per WSDOT 2-03.3(14)D.

Owner will contract with an independent testing and inspection agency testing to perform the task(s) below. Contractor is responsible for scheduling and coordinating these tests.

 - 3. One in-place density test every 50 lineal feet of trench for the first 150 lineal feet of trench backfilled on each alignment and one test every 250 lineal feet of trench thereafter. The intent is to perform three (3) tests at the beginning of the alignment(s) to identify compaction effort required and then test every 250 lineal feet.
 - 4. One test whenever soil conditions change, per the direction of Inspector, and continuing with tests every 250 lineal feet as described above.
- C. The Contractor shall provide all additional testing and inspection in accordance with Section 01 44 00.

PART 2. PRODUCTS

2.01 GENERAL

- A. Comply with "Quality Assurance" provisions, "References," and Specifications. Where these may be in conflict, the more stringent requirements govern.

2.02 MATERIALS

- A. Pipe Bedding: WSDOT 9-03.12(3) – Gravel Backfill for Pipe Zone Bedding. Pipes shall be bedded and backfilled as shown on plans.
- B. Trench Backfill, per plans, and depending on location:
 - 1. WSDOT 9-03.19 – Bank Run Gravel
 - 2. WSDOT 9-03.9(3) – Crushed Surfacing Top Course
- C. WSDOT 9-03.9(3) – Crushed Surfacing Top or Base Course. Gravel driveways and surface

repairs shall be prepared per the Plans.

- D. WSDOT 9-03.9(2) – Permeable Ballast. Existing gravel access surface repair shall be replaced in kind and prepared per the Plans.
- E. Control Density Fill (CDF)
 - 1. CDF shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures proportioned to provide a non-segregating, self-consolidating and free-flowing material which will result in a hardened, dense, non-settling and excavatable fill.
 - 2. CDF shall be used as fill above and as separation between utilities where cover is less than standard required and as shown on the Plans.
 - 3. CDF shall be a mixture of Portland cement, fly ash, aggregates, water, and admixtures that been batched and mixed in accordance with Section 6-02.3 of the WSDOT/APWA specifications. Materials are as follows:
 - a. Portland Cement AASHTO M 85 or WSDOT/APWA 9-01
 - b. Fly Ash Class F
 - c. Aggregates WSDOT/APWA 9-03.1(2)B
 - d. Water WSDOT/APWA 9-25
 - e. Admixtures WSDOT/APWA 9-23.6
 - 4. CDF shall be used in the following proportions for 1 cubic yard. Batch weights may vary depending on specific weights of aggregates:
 - a. Maximum gallons of mixing water per cubic yard; 50
 - b. Lbs. of Cement per cubic yard; 50
 - c. Lbs. of Fly Ash per cubic yard; 250
 - d. Lbs. of Dry Aggregate per cubic yard, Class 1 or 2; 3200
 - e. Sand as per WSDOT/APWA 9-03.1(2) B
 - 5. CDF shall be batched to provide a flowing, non-segregating mix, with a slump between 6" and 8".

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Utility Location. Make every effort to identify the location of all existing underground utilities. Contact Utility Locate Service 48-hours in advance of any excavation.
- B. Pothole potential utility conflicts.
- C. Pothole locations where new pipe connects to existing pipe.

3.03 TRENCH EXCAVATION AND BACKFILL

A. Trench Excavation.

1. Trench excavation shall conform with the WSDOT Standard Specifications Section 7-08 – General Pipe Installation Requirements and Section 2-09 – Structure Excavation. Special attention shall be paid to the requirements for trench safety noting that all work shall be performed in strict compliance with WAC 296-155 – Safety Standards for Construction Work.
2. Contractor shall be solely responsible for any shoring, cofferdams or trench safety systems employed on the project.
3. All trenches shall be excavated to true and smooth bottom grades in accordance with the lines given in the Plans. The trench bottom shall provide uniform bearing and support for each length of pipe. The banks of the trenches shall be kept as nearly vertical as soil conditions will permit, and where required to control trench width or to protect adjacent structures, the trench shall be sheeted and braced. Width of excavation for utility trenches shall be in accordance with Plan Details. No additional payment will be made for extra excavation required due to poor soil conditions without prior written authorization.
4. Excess material shall be disposed of off-site at a site arranged by the Contractor. Disposal operations shall comply with WSDOT Standard Specification 2-03.3(7)C - Contractor-Provided Disposal Site. All hauling costs shall be considered incidental to the contract price, no extra payments will be made for haul.
5. Provide and operate all material, equipment and labor necessary to keep excavations and earth embankments free from water during construction. Dewatering shall prevent weakening foundations, undercutting trench walls, or otherwise affecting the stability of sub-grades and foundations. Establish and maintain positive drainage away from excavations to prevent surface water from entering excavations. Water shall be disposed of in a manner which prevents injury to public or damage to property.
6. Backfill or otherwise cover all trenches at the end of each working day to protect public safety. The length of open trench excavation in advance of pipe laying operations shall not exceed the amount the Contractor can complete that day, or as required by Skagit County for work within the County ROW. In no case shall the length of an open trench or size of an excavation exceed the Contractor's ability to safeguard the public welfare.

B. Bedding.

1. Bed Pipe per WSDOT 7-08.3(1)C - Bedding the Pipe.

C. Backfill.

1. Trench backfilling operations shall comply with WSDOT Standard Specification 7-08.3(3) - Backfilling.
2. In areas beneath driveways, sidewalks, or within 5-feet of the roadway template (including shoulder or structures), backfill shall be compacted to 95% of the maximum density described in WSDOT Standard Specification 2-03.3(14)D - Compaction and Moisture Control Tests. In turf and landscape areas outside roadway templates and not beneath pavement, drives or sidewalks, excavations shall be compacted to 90% of the maximum density described above.

3. Construction shall progress only when weather conditions will not adversely affect the quality of the finished work. At the same time, the Contractor must be prepared to take such measures as are necessary to complete the construction within the specified contract period. Where soils cannot be compacted due to moisture content, material shall be aerated or removed and replaced with a suitable granular backfill material.

D. Control Density Fill (CDF) Backfill

1. Placement

- a. CDF shall be discharged from the mixer by any reasonable means (which does not segregate the material) into the area to be filled. The CDF shall be brought up uniformly to the elevation shown on the plans.
- b. CDF shall not be placed on frozen ground.
- c. CDF patching, mixing, and placing may be started if weather conditions are favorable. At the time of placement, CDF must have a temperature of at least 40 degrees F. Mixing and placement shall stop when the temperature is 38 degrees F or less and falling. Placement may resume when the temperature is at 34 degrees F and rising. Each filling stage shall be as continuous as practical.
- d. Trench sections to be filled with CDF shall be contained at either end of the trench section by bulkheads or earth fills.
- e. The Contractor shall place the CDF to within 4 inches of the base of the finished surface section. The finished surface section shall then be placed over the CDF in accordance with the Plans.
- f. The Contractor shall provide steel plates to span the utility trenches and prevent traffic contact with the CDF for at least 24 hours after placement or until the CDF is hard enough to prevent rutting by construction equipment or traffic.

2. Compaction

- a. For flowing CDF, compaction is not necessary for placement. The Contractor may, as an option, adjust the water content to obtain a 0 to 1" maximum slump mixture if the material is to be compacted in lifts not to exceed 6". Compaction will be accomplished by use of a hand vibratory plate.
- b. At least 24 hours prior to placing any surfacing materials on the roadway (unless other advance arrangements are made with the County), it shall be the responsibility of the Contractor to provide density test reports by a qualified soils laboratory. A minimum of one test shall be taken every 300 lineal feet of trench and every 1.5 feet vertically unless otherwise specified by the County.

E. Unsuitable Trench Overexcavation.

1. In the event that deep unsuitable material is encountered at the intended grade of piping, excavate up to 12-inches of the material from the bottom of the trench to provide a firm and unyielding surface, and replace with Structural Fill materials per 2.02B above depending on backfill for the location. Overexcavation and

Replacement Structural Fill will be paid for at the unit prices established on the Bid Proposal.

2. To qualify for payment, the Engineer must inspect and authorize all Overexcavation and Replacement Structural Fill. Any removal and replacement of unsuitable material not inspected by the Engineer prior to removal will be considered incidental to the contract and will not qualify for unit price payment.

*****END OF SECTION*****

SECTION 31 32 11 - SOIL SURFACE EROSION CONTROL

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Work includes but is not limited to following:
 - 1. Temporary measures to prevent soil erosion and sedimentation of storm sewers, ditches, streams, or other bodies of water.

1.02 RELATED SECTIONS

- A. Coordinate related work specified in other parts of the Project Manual, including but not limited to following:
 - 1. Section 01 56 00 Temporary Barriers, Enclosures and Controls
 - 2. Section 31 10 00 Site Clearing
 - 3. Section 31 20 00 Earth Moving
 - 4. Section 31 23 33 Trenching and Backfill
 - 5. Section 32 93 00 Forest Restoration
 - 6. Section 33 05 00 Common Works Results for Utilities

1.03 REFERENCES

- A. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, Latest Edition.
- B. Washington State Department of Ecology's Latest Edition of the Stormwater Management Manual for Western Washington.

1.04 SUBMITTALS

- A. Submit in accordance with Sections 01 33 00, any of the following that might be used throughout the course of the project:
 - 1. Geotextile for temporary silt fence.
 - 2. Geotextile Encased Check Dam
 - 3. Compost for compost berm (not anticipated)
 - 4. Straw wattles and stakes (not anticipated)
 - 5. Inlet Protection (not anticipated)
 - 6. Track clean plates or quarry spalls (not anticipated)
 - 7. Any other erosion control products proposed for use on the site.

1.05 QUALITY ASSURANCE

- A. Installer shall be a Specialist.
- B. Regulatory Requirements: Section 01 41 00.

PART 2. PRODUCTS

2.01 MATERIALS

Possible BMPs that may be needed or used on the project, although not necessarily called out to be used on the Plans, may include but not be limited to the following:

- A. Silt Fence. Silt Fence shall comply with WSDOT Standard Specification 9-33 – Construction Geotextile and meet the properties described in Table 6 of said specification.
- B. Straw Mulch. Per WSDOT 9-14.4(1) – Straw
- C. Compost. Compost shall be in accordance with WSDOT Standard Specification 9-14.4(8).
- D. Track Clean Plates. Track clean plates shall be Track Clean™ Construction Entrance Plates or approved equal. Plates must adhere to the guidelines of BMP C105: Stabilized Construction Entrance, found in Volume II of the WA State Ecology Stormwater Management Manual of Western Washington.
- E. Quarry Spalls. 4”-6” diameter quarry spalls for construction entrance, (WSDOT 9-13.1(5) with nothing passing a 6” sieve), if required and used instead of track clean plates.
- F. Straw Wattles. Per WSDOT 9-14.5(5).
- G. Inlet Protection. Catch Basin inserts per WSDOT 8-01.3(9)D.
- H. Orange Barrier Fence. Orange barrier fence shall comply with WSDOT Standard Specification 9-14.5(8) – High Visibility Fencing.
- I. Geotextile Encased Check Dam – non-biodegradable check dams per WSDOT 9-14.5(4)B.

PART 3. EXECUTION

3.01 PREPARATION

- A. Planning Of Construction: Plan and coordinate to reduce sediment pollution. Install all site BMPs prior to the commencement of land disturbing activities. Minimize the area of disturbance. Keep the area of clearing and grubbing to the minimum necessary for construction.

3.02 INSTALLATION

- A. Install in accordance with “Quality Assurance” provisions, “References,” and Specifications. Where these may be in conflict, the more stringent requirements govern.
- B. Pump Water. Practice sound pump water management to reduce sediment production. Discharge pump water into stabilized surfaces and allow filtering through existing vegetation. Repair discharge areas, upon completion of construction, to pre-existing conditions or better. Do not pump water into adjacent water bodies.
- C. Stabilization. Stabilize all slopes, channels, ditches or any disturbed area as soon as possible after the final grade or final earthmoving has been completed. Upon completion of the project, stabilize all areas which were disturbed by the project to prevent accelerated erosion. Maintain any erosion and sedimentation control facility required or necessary to protect areas from erosion during the stabilization period.

D. Earthwork.

1. Control excavation for site work operations. Stockpile the material removed from the excavation in area where a minimum of sediment will be generated and where other damage will not result from the piled earth.
2. Stockpile topsoil separately and redistribute where shown on plans uniformly after grading.
3. Protect all stockpiled soil materials from erosion through the use of plastic sheeting or similar temporary measures, secured against wind disturbance.
4. Any area stripped of vegetation, where no further work is anticipated for a period of 14 calendar days, shall be immediately stabilized with an approved erosion control method such as seeding, mulching, netting, erosion control blankets, etc.
5. All disturbed areas shall be promptly and thoroughly stabilized against erosion during periods of wet weather, particularly when work is not being performed at the site.

3.03 MAINTENANCE AND CLEANING

- A. Maintenance. Maintain the erosion control measures and facilities in proper condition so that they will individually and collectively perform the functions for which they were designed. In order to insure the effectiveness and proper maintenance of the measures and facilities, the Contractor and Owner shall make periodic inspections at sufficiently frequent intervals to detect any impairments of the structural stability, adequate capacity, or other requisites of the herein approved measures and facilities which might impair their effectiveness. Take immediate steps to correct any such impairment found to exist.
- B. Clean: Leave installations clean; premises free from residue of work of this section.
- C. Street Sweeping: If onsite measures fail to prevent soil migration to street, Contractor shall provide regular sweeping.

*****END OF SECTION*****

SECTION 31 50 00 – EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF SECTION

- A. This section includes all work related to providing temporary support and protection for excavations to safeguard public health, protect workers, protect existing improvements and insure the safe prosecution of the work. The Contractor may elect to employ any combination of shoring, tunneling, boring, sliding trench shield, or other means to complete the work.
- B. The Contractor shall provide all equipment, material, labor and design services necessary to develop and maintain adequate excavation support and protection. The Contractor shall determine the need for and adequacy of excavation support and protection requirements.
- C. The Contractor shall be solely responsible for any excavation support and protection or trench safety systems employed on the project. In no way shall the Owner assume any responsibility for the protection of life or property implied by the use of such systems.

1.02 RELATED SECTIONS

- A. Related work specified elsewhere:
 - 1. Section 31 23 33 – Trenching and Backfilling

1.03 REFERENCE STANDARDS

- A. 29 CFR 1926 Subpart P - Excavations

1.04 LAWS AND REGULATIONS

- A. The Contractor shall comply with and give notices required by all federal, state, and local laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither the Owner nor Engineer or their staff will be responsible for monitoring Contractor's compliance with Laws and Regulations.
- B. All structure excavation, trenching, and shoring shall be performed in strict compliance with 29 CFR 1926 Subpart P - Excavations as well as all other applicable local, State, Contracting Agency, and Federal laws and regulations."
- C. OSHA standards are to be followed at all times, and minimizing risk is a priority.

PART 2 - PRODUCT

Not Applicable.

PART 3 - EXECUTION

3.01 METHODS

- A. The Contractor shall make the determination as to the most effective means for ensuring excavation support and protection. This may include, but is not limited to, the following:
 - 1. The Contractor may dig open pits or perform extra excavation (at no expense to the Owner) without shoring or cofferdams, with prior approval by the Engineer and Owner.
 - 2. Use of shoring or cofferdams if in compliance.
 - 3. Specific requirements related to working in trenches shall conform to the most recent edition of the WSDOT *Standard Specifications*.
- B. Any damage to existing or proposed improvements resulting from the Contractor's excavation support and protection system shall be repaired and included as a part of this pay item.

*****END OF SECTION*****

SECTION 32 12 16 – ASPHALT PAVEMENT

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Work includes but is not limited to following:
 - 1. Provide all material, labor, and equipment to prepare subgrade, base course, top course, and one or more lifts of asphalt concrete pavement (ACP) (and synonymous with Hot Mix Asphalt (HMA)) at the locations, line and grade shown on the Plans or at locations where asphalt concrete pavement is removed for watermain or sewer installations and needs to be replaced to match pre-construction condition.

1.02 RELATED SECTIONS

- A. Coordinate related work specified in other parts of the Project Manual, including but not limited to following:
 - 1. Section 31 23 33 – Trench Excavation and Backfill

1.03 REFERENCES

- A. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, current edition.
- B. Sudden Valley Community Association and Whatcom County Road Standards.

1.04 SUBMITTALS

- A. Submit in accordance with Section 01 33 00 – Submittal Procedures:
 - 1. Crushed Surfacing Top Course
 - 2. Asphalt Concrete Mix design showing compliance with specifications
 - 3. Tack coat and joint sealant materials

1.05 QUALITY ASSURANCE

- A. Installer shall be a Specialist.
- B. Testing and Inspection.

Contractor will provide testing and inspection by independent testing and inspection agency which will perform the following tasks:

- 1. Gradation analysis for crushed surfacing top course.
- 2. Compaction and Moisture Control Tests per WSDOT Standard Specifications Section 5-04.

Owner will contract with an independent testing and inspection agency testing to perform the task(s) below. Contractor is responsible for scheduling and coordinating these tests.

- 3. One compaction test shall be performed for every 100 linear-feet of trench restoration, but not less than one, for each of the following surfaces: Subgrade, Crushed Surfacing Top Course (backfill and pavement base layer), and Asphalt. Testing and sampling of asphalt shall conform to WSDOT Standard Specification Section 5-04, non-statistical acceptance procedures shall be employed in sampling of materials and density shall be determined using a nuclear density gauge.

1.06 PROJECT SITE CONDITIONS

- A. Coordination: Notify the Engineer and County inspector upon completion of subgrade preparation work, completion of base course, and also of intended schedule for final surfacing. Subgrade compaction test results complying with project specifications will be required prior to authorization to place aggregate courses. The Engineer and Sudden Valley Community Association inspector will inspect all subgrades immediately prior to scheduled surfacing and notify the Contractor of unsatisfactory conditions. Do not proceed with placement of HMA until all unsatisfactory subgrade conditions have been corrected to the satisfaction of the Engineer and Sudden Valley Community Association inspector.
- B. Grade Control: Establish and maintain required lines, elevations, and drainage patterns.
- C. Weather Conditions: Frozen materials or materials mixed or coated with ice or frost shall not be used. Do not surface over frozen or excessively wet subgrade conditions.

PART 2. PRODUCTS

2.01 GENERAL

- A. Comply with “Quality Assurance” provisions, “References,” and Specifications. Where these may be in conflict, the more stringent requirements govern.

2.02 MATERIALS

- A. Asphalt Concrete Pavement.
 - 1. Asphalt concrete pavement used for roadway wearing, base and leveling courses shall be Hot Mix Asphalt (HMA) Class ½ inch Mix Design that has been tested and approved for inclusion on the WSDOT Qualified Products List (QPL) within the previous twelve months.
 - 2. Aggregate materials used for asphalt concrete pavement shall be a manufactured product complying with WSDOT Standard Specification 9-03.8 for the Class of Asphalt Concrete specified.
- B. Crushed Surfacing Top Course. Crushed surfacing shall be in accordance with WSDOT Standard Specification 9-03.9(3).
- C. Tack Coat. Shall be in accordance with WSDOT Standard Specification 5-04.3(4).
- D. Joint Sealant. Shall be in accordance with WSDOT Standard Specification 5-05.3(8).

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 INSTALLATION

- A. Install in accordance with “Quality Assurance” provisions, “References,” Specifications, and Manufacturer’s directions. Where these may be in conflict, the more stringent requirements govern.

B. General.

1. Where new pavement abuts existing roadway, saw cut existing pavement to provide a clean edge to pave against, unless otherwise shown and noted. Minimum trench width acceptable for HMA placement is 2-feet for private roads, unless otherwise approved by the Engineer.
2. All work associated with the manufacture, transport, placement, compaction and testing of Asphalt Concrete Pavement shall be in conformance with Standard Specification 5-04.3
3. Where small areas are to be paved, the requirements for batch quantities shall be adjusted to reflect more appropriate quantities.
4. All patched areas shall be saw cut on neat straight lines generally running parallel or perpendicular with the patch. Cuts shall be through the full depth of asphalt.

C. Subgrade Preparation.

1. Subgrade Preparation: Prepare road, parking, and sidewalk subgrades by grading to appropriate lines, grades, and elevations necessary to establish specified drainage patterns as well as accommodate specified base courses and final surfacing thickness. Compact subgrade to 95% of ASTM D1557 maximum dry density, at plus or minus 2% of optimum moisture, prior to placement of base and finish courses. Use compaction equipment appropriate to soil type. Display adequate compaction by proof rolling surface in the presence of the Engineer. Notify Engineer 48 hours in advance of proof rolling. Remove and replace unsuitable subgrade with gravel backfill only as authorized by the Engineer described below.
2. Base Courses: Place Bank Run Gravel and Crushed Surfacing Top Course material to lines, grades, and compacted depths indicated in the plans.
3. Roller compact Bank Run Gravel and Crushed Surfacing Top Course lifts separately using vibratory steel-wheel roller.
4. Slope finished base courses for proper drainage as indicated in the plans.

D. Removal and Replacement of Unsuitable Subgrade with Gravel Backfill.

1. Removal and replacement of unsuitable subgrade with gravel backfill shall only be performed as authorized by the Engineer. Unauthorized work will result in non-payment for the work.
2. Subgrade shall be tested for weak and yielding soil by proof rolling with construction equipment or other methods as directed by the Engineer. When unsuitable bearing materials are encountered at required subgrade elevations, carry excavations 2 feet deeper or as directed by Engineer, place separation geotextile on the bottom of the excavation, replace with CSTC Structural Fill in 2-foot lifts or as directed by the Engineer, and compact to 95% of ASTM D1557 maximum dry density.

E. Placement of HMA.

1. The structural section of the HMA placed shall be equal to the section of the existing pavement, or 3-inches for aprons/driveways and 4-inches for roadways, whichever is greater.

2. Immediately prior to placement of HMA a tack coat shall be uniformly applied to all edges to be joined and lapping six (6) inches over the existing pavement. The lines from the new asphalt pavement shall be raked over the tack coat, feathered and rolled or tamped to seal the joint. The edge shall be sealed with hot tar seal, all edges, then topped with paver sand, in accordance with WSDOT/APWA Standards.
- F. Equipment.
1. The Contractor may use specialized equipment when paving small or irregular areas.
 2. Paving machines shall be self-propelled - drag pavers are not permitted.
- G. Paving Operation. Weather limitations per WSDOT Standard Specification 5-04.3(1).

3.03 ADJUSTING AND CLEANING

- A. Make any adjustments as required.
- B. Clean: Leave installations clean; premises free from residue of work of this section.

*****END OF SECTION*****

SECTION 32 31 13 – CHAIN LINK FENCES AND GATES

PART 1. GENERAL

1.01 DESCRIPTION OF WORK

- A. Work consists of furnishing all labor, materials, and incidentals necessary to erect all 7-foot high galvanized chain-link fence (6' fence height plus 1' barb wire height) and gates at the location shown on the drawings. Fence shall be Type 3 per WSDOT Standard Plan L-20.10-03 and Gate shall be 20-ft Double Gate per WSDOT Standard Plan L-30.10-02, both modified to include 3-strand barbed wire (total height of 7-ft). Construction to provide a rigid, taut fence closely conforming to the surface of the ground.
- B. Work included
 - 1. Fabric, line posts, ends, corner and pull posts, gate posts, gate frames, top rails, and post braces and accessories. Provide a complete fencing and gating system.

1.02 RELATED SECTIONS

- A. Section 05 50 00 – Metal Fabrications

1.03 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. A 53 Standard Specification for Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary Uses.
 - 2. A 153 Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
 - 3. A 392 Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.

1.04 SUBMITTALS

- A. Submit shop drawings showing fence height, type of fabric, barbed wire details, and location and size of posts and gates, including details of post tops, rails, braces, foundations, footings, gate posts, hinges, frames, latches, ties and other accessories.
- B. Submit specialist installer or subcontractor qualifications.

1.05 QUALIFICATIONS OF INSTALLER

- A. Installer must be experienced in fence installations and must examine conditions under which fence and gates are to be installed. The Contractor shall notify the Engineer in writing of improper conditions of work, and shall not proceed with work until unsatisfactory conditions have been corrected.
- B. Installer qualifications shall be submitted to Owner and Engineer for approval.

PART 2. PRODUCTS

2.01 FENCES, POSTS, RAILS AND BRACES

- A. All steel tubular members shall comply with provisions of ASTM A 53, Schedule 40, for

weight and coating.

2.02 FABRIC

- A. Chain link fabric to conform to ASTM A 392, No. 9 gage wire, 2-inch mesh, Class II galvanizing.
- B. Fabric galvanized after weaving.
- C. Fabric knuckled at bottom selvage and twisted and barbed at top.

2.03 LINE POSTS

- A. Posts of galvanized steel.
- B. Posts round in section, with 2.375-inch outside diameter and weighing 3.65 lb/ft.

2.04 END, CORNER PULL POSTS

- A. Posts of galvanized steel.
- B. Posts round in section, with 2.875-inch outside diameter and weighing 5.79 lb/ft.

2.05 GATE POSTS

- A. Posts of galvanized steel.
- B. Gate leaves over 6 feet - 0 inch and up to and including 13 feet - 0 inch wide: 4 inches O.D. Schedule 40 pipe and weighing 9.1 lb/ft.
- C. Gate leaves over 13 feet 0 inch and up to and including 18 feet 0 inch: 6- 5/8 inch O.D. Schedule 40 pipe and weighing 18.97 lb/ft.

2.06 GATE FRAMES FOR CHAIN LINK FENCING

- A. Frames of galvanized steel.
- B. Frames round in section, with 1.9-inch outside diameter, and weighing 2.72 lb/ft.
- C. Frames shall have intermediate members and/or diagonal truss rods for gate leaves more than 8 feet wide.
- D. Gate frame joints shall be made by welding or by means of heavy fittings making rigid and watertight connections.

2.07 TOP RAILS AND POST BRACES

- A. Top rails and post braces of galvanized steel.
- B. Top rails and post braces round in section, with 1.66-inch outside diameter, and weighing 2.27 -lb/ft.

2.08 BARBED WIRE

- A. Barbed wire shall be double strand twisted 12-1/2 gauge galvanized with 14 gauge, 4 point barbs spaced on approximately 5-inch centers. Extension arms to accommodate barbed wire shall withstand a 250-pound pulldown load from end of arm.

2.09 ACCESSORIES AND ATTACHMENTS

- A. Stretcher bars: Galvanized steel 3/16 by 3/4-inch in cross section, or equivalent cross section with length equal to full height of fabric.

- B. Truss rods: Galvanized steel, 3/8-inch-diameter, or equivalent cross section, and shall have suitable adjustment.
- C. Post tops: Caps of pressed galvanized steel. Provide with a hole suitable for through-passage of the top rail. Fit snugly to the post, have means for attaching securely to the post and exclude moisture from tabular posts.
- D. Gates swing: Swing type, complete with latches, stops, keepers, hinges, locks and fabric. Fabric to match fence. Hinges of adequate strength to support gate and not twist or turn under action of gate. Latches of plunger bar type and full gate height located in a manner that will engage the gate stop. Forked latches used for single gates less than 10 feet wide. Latches shall provide for locking. Stops shall consist of a flush plate with anchor placed in concrete to engage the plunger bar of the latch. Other approved types of stops may be used for single gates less than 10 feet wide. Keepers shall be substantial devices for securing and supporting the free end of the gate in open position.
- E. Top rail and bottom rail couplings: Outside sleeve type at least 6 inches long. At least 20% of the couplings shall have an internal heavy spring to take up expansion and contraction.
- F. Brace wire, tie wire, and tension wire:
 - 1. Galvanized wire meeting requirements of ASTM A 12 1, Class 3 coating.
 - 2. Unless otherwise designated, size of wire shall not be smaller than the following:

Tension wire	No. 7
Brace wire	No. 9
Tie wires or clips for fastening	
field fence to steel posts	No. 12
 - 3. Tie wires for chain-link fence of size and type recommended by manufacturer, but not smaller than No. 9 for post ties or No. 12 for rail and brace ties. Equivalent galvanized steel clips or aluminum wire or clips may be used as accepted by the Engineer.
- G. Galvanizing: All pipe sections galvanized after fabrication shall be in accordance with ASTM A 53. All other items incidental to erection of fence except fabric and wire fabric ties galvanized after fabrication in accordance with ASTM A 153. Wire fabric ties will have not less than 0.8 ounce of zinc per square foot.

2.010 CONCRETE FOOTINGS

- A. Concrete shall be 3,000 psi minimum.
- B. Concrete shall be in accordance with WSDOT Section 9-16.1(1)F and WSDOT Standard Plans L-20.10-03 and L-30.10-02.

PART 3. EXECUTION

3.01 CLEARING AND GRADING

- A. Contractor shall perform such clearing and grading as necessary to construct fence to required alignment and provide a reasonably smooth ground profile at the fence line.

3.02 POST ASSEMBLIES

- A. End, corner, gate, and pull or intermediate anchor posts placed at designated locations.
- B. Posts securely braced and holes filled with concrete. Form not required for post encasement

3.03 HORIZONTAL DEFLECTION

- A. At points of deflection where fence changes alignment by more than 5 degrees provide a post brace and truss rod in each fence panel to the post located at the angle point.
- B. Footings for all posts located at points where the change in alignment exceeds 5 degrees shall be constructed as specified for end posts.

3.04 LINE POSTS

- A. Line posts spaced at not more than 10-foot centers.

3.05 POST BRACES

- A. A brace and truss assembly shall support each gate, corner, pull, or end post for chain link fencing. Brace shall extend to each adjacent line post at mid-height of fabric. Truss shall extend from line post back to gate, corner, pull, or end post.

3.06 FABRIC

- A. Fabric shall not be erected until 5 days after the time of setting the posts in concrete. Fabric shall be fastened to line posts with clips or bands spaced approximately 12 inches apart and to top rail with bands or tie wires at approximately 24-inch intervals. Pull fabric taut and tie to posts, rails and tension wires. Install fabric on security side of fence and anchor to framework so that fabric remains in tension after pulling force is released.

3.07 TENSION WIRES

- A. Tension wires installed at bottom of fabric before stretching fabric and tied to each post with wire ties or clips.

3.08 ELECTRICAL GROUNDS

- A. Chain-link fence which crosses beneath any primary electrical power transmission line, other than a secondary feeder line for individual customer service, shall be properly grounded. Grounding shall consist of placing one ground rod at point of crossing and one 25 to 50 feet in each direction from the crossing.
 - 1. Chain-link fence erected adjacent to and within 50 feet of a primary power line shall be grounded by placing ground rods at not more than 500-foot intervals.
 - 2. Each applicable straight section of fence shall have at least one ground. Engineer may require installation of an additional ground at terminus of a section of fence or at other locations near areas of pedestrian traffic.

3. Ground rod shall be connected to fence.

*****END OF SECTION*****

SECTION 32 93 00 - FOREST RESTORATION

PART 1. GENERAL

1.01 DESCRIPTION OF WORK

- A. Work in this section shall include all labor, equipment and materials necessary for re-establishing native forest vegetation in areas disturbed during construction, and replacing in kind any landscape vegetation damaged by construction.

1.02 RELATED SPECIFICATIONS

- A. Section 31 10 00 Site Clearing
- B. Section 31 13 17 Tree and Shrub Protection
- C. Section 31 20 00 Earth Moving
- D. Section 31 23 33 Trench Excavation and Backfill
- E. Section 31 32 11 Soil Surface Erosion Control

1.03 PLANTING GUARANTEE

- A. During the one (1) year guarantee period should any plantings show signs of failure such as dead or dying plants, etc., the Contractor shall repair or replace all deficient items to the satisfaction of the Engineer.
- B. All graded areas not otherwise protected and stabilized by October 15 shall be covered with two (2) inch depth straw to prevent erosion and contained with staked down biodegradable mesh or matting. Straw to be provided and installed by the Contractor. Do not perform planting or seeding when ground is frozen, snow covered, muddy or in an otherwise unsatisfactory condition. When unforeseen conditions detrimental to plant growth are encountered, such as adverse drainage conditions, obstructions, compaction, or toxified soils, notify the Engineer before proceeding.

1.04 SUBMITTALS

- A. The Contractor shall submit product specifications and installation recommendations for all materials to be provided under this section.
- B. Submit plant supplier name, information, and written documentation verifying plant origination prior to plan installation.
- C. Upon planting areas acceptance, submit written maintenance instructions recommending procedures for maintenance of seeded areas.

PART 2. PRODUCTS

2.01 FOREST RESTORATION AREAS

- A. Topsoil Material
 - 1. Topsoil for restoration areas shall be per Section 9.14.2(2) and 9.14.2(3) Topsoil Type B and Type C, respectively, of the Standard Specifications. It is the intent of the contract that all topsoil be husbanded from the project site, and augmented as

necessary with imported topsoil. All topsoil shall be free from materials toxic to plant growth, noxious weeds or seeds, rhizomes, roots, stones, and other debris.

B. Mulch Material

1. Mulch shall be bark or wood chip mulch per WSDOT 9-14.5(3), either salvaged and stockpiled from the site, or imported.

C. Plants

1. Plant material shall be obtained from native plant nurseries growing stock from the Puget Sound lowlands. When possible, obtain plants from a local, Whatcom or Skagit County nursery.

D. Water

1. The Contractor shall furnish water as required for planting and establishing vegetation in seeded areas. Provide all necessary hoses, equipment, attachments, and accessories for adequate watering of seeded areas.
2. Contractor may coordinate use of District water for forest restoration planting with the installation of a Contractor installed metered water connection per the District's Design and Construction Standards and approved RPBA. Contractor will not be charged for District water usage for necessary mitigation irrigation.
3. A Contractor designed and installed temporary irrigation system may be connected using a Contractor installed water service connection per the District Design & Construction Standards and approved RPBA.

PART 3. EXECUTION

3.01 PLANT INSTALLATION TIMING

- A. Planting shall take place during the dormant season (between October 15th and April 1st). Planting in the fall is preferred, when the soil is the warmest and just before the winter rains. Bare root material may be used between December 1st and March 15th.
- B. The District or their representative shall inspect the plant material prior to installation.

3.02 PLANTING GUIDELINES

- A. Actual planting shall follow the digging of holes as closely as possible to prevent drying excavated soil. Each plant shall be placed in a hole and backfilled with native soil. Backfill shall be tamped firmly to remove voids in soil. Excess soil shall be smoothed and firmed around plants leaving a slight depression to collect water.
- B. All plants shall be watered immediately after planting unless soils are heavily wet.
- C. Inspect all subgrades for debris and adverse drainage conditions. Remove all debris including rocks 1-inch in diameter and larger, sticks, roots, sod and other deleterious material that may affect plant viability. Notify the Owner of any grades or conditions which might create adverse or undesirable drainage patterns.
- D. Smoothly blend and feather topsoil into existing surrounding grades. Rake or lightly harrow topsoil until the soil is friable and of uniform texture and satisfactory for plant placement.
- E. Replace any and all damaged or dead plants observed prior to final project acceptance at

no additional cost to the Owner.

- F. The Contractor shall protect, care for, and replace as necessary all planted areas through the Contractor's contractual warranty period. Care shall include equipment and labor necessary to provide sufficient watering of all plants until final acceptance.
- G. Survival rate through the contractual warranty period shall be 100%. Replace all dead plants.

*****END OF SECTION*****

SECTION 33 05 00 - COMMON WORKS RESULTS FOR UTILITIES

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. This section covers information supplementary to the Drawings and the WSDOT Standard Specifications. The Contractor shall furnish and install pipe and fittings as shown on the Drawings, as specified in these Specifications, and as required for a complete and functional installation. All pipe and fittings shall be new.

Piping systems, including pipe, fittings, anchors, and all other elements, shall be detailed, fabricated, and installed to resist all internal and external loads which will be imposed upon them. Pressure ratings and materials stated in these Piping Specification sections are minimum acceptable standards. Systems shall be suitable for the service intended.

The pipe diameters shown on the Drawings and used in these Specifications are inside diameters unless specific reference is made to outside diameter of the pipe or the pipe is a standardized product normally designated by a nominal size, e.g., ductile iron pipe.

The Contractor shall furnish and install pipe and fittings as shown on the Drawings, as specified in these Specifications, and as required for a complete and functional installation. The pipe shall be new, manufactured in accordance with these Specifications and Drawings.

- B. Work includes but is not limited to following:
1. Trenching, unsuitable trench bottom over-excavation, bedding, backfilling, compacting and disposal of excess materials as required for installation of all underground utilities, conduit and other miscellaneous structures.
 2. Providing all material, equipment and labor necessary to complete the excavation and backfill operations necessary to install the underground utilities depicted on the plans.
 3. Trench dewatering and pumping.

1.02 RELATED SECTIONS

- A. Coordinate related work specified in other parts of the Contract Documents, including but not limited to following:
1. Geotechnical Engineering Report which summarizes the geotechnical site explorations and design recommendations for the reservoirs and other site work.

Lake Whatcom Water and Sewer District
Division 7 Reservoir Seismic Upgrade
Bellingham, Washington
for Wilson Engineering, LLC
Prepared by GeoEngineers
June 30, 2022
 2. Section 01 44 00 Quality Assurance Quality Control
 3. Section 31 20 00 Earth Moving
 4. Section 31 23 33 Trenching and Backfilling
 5. Section 33 05 63 Precast Concrete Utility Structures

6. Section 33 10 00 Potable Water Systems
7. Section 33 16 33 Concrete Water Reservoirs
8. Section 33 35 00 Gravity Sewer Piping
9. Section 33 41 00 Storm Utility Drainage Piping

1.03 REFERENCES

- A. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, latest edition; Sections 2-09 - Structure Excavation, and 7-08 - General Pipe Installation Requirements.
- B. WSDOT Standard Plans for Road Bridge and Municipal Construction, most recent edition.
- C. Washington State Department of Ecology's Stormwater Management Manual for Western Washington, latest edition.
- D. Lake Whatcom Water and Sewer District Design and Construction Standards, February 23, 2022 or latest edition.

1.04 SUBMITTALS PRIOR TO CONSTRUCTION

- A. Submittals shall be made in accordance with the Standard Specifications. In addition, the following specific information shall be provided.
 1. Field Fabrication - For pipe lines which are assembled in the field from standard fittings, submit complete data on pipe and fittings, including any manufacturer's installation instructions.
 2. Pipe Support Drawings - Support type by catalog number, shop drawing detail, number, manufacturer's installation instructions.
 3. Material Certification - Certification of all materials, and manufacturing properly executed by the manufacturer, shall be available to show compliance with the Specification of materials being furnished. Test data on tests performed shall be provided as requested by the Engineer.
 4. Existing Pipe Verification - Expose all existing pipes which are to be connected to new pipelines. Verify the size, material, elevation, horizontal location, and pipe service of these existing pipes with sufficient lead time to make accommodations as necessary.

1.05 SYSTEM DESCRIPTION

- A. Provide protection of existing utilities affected by the work and make every effort to minimize disruptions to all utility services.
- B. If, during the course of construction, excavation interrupts traffic for longer than 15 minutes, inform the Owner and make all necessary arrangements for ingress and egress. In the event of such road closures, the Contractor shall be solely responsible for all traffic control measures including but not limited to flagging, barricades and cones.
- C. Trenches shall be closed or covered with steel plates at the end of each work day.

1.06 QUALITY ASSURANCE

- A. Regulatory Requirements:

1. See referenced Codes, ordinances and the like, Division 1 and Standard Specifications.
 2. Comply with the requirements of all applicable regulatory agencies having jurisdiction over this work including the Washington Industrial Safety and Health Act.
- B. Testing and Inspection:
1. Refer to Section 01 44 00 and Section 31 23 33.

PART 2. PRODUCTS

2.01 GALVANIZING

- A. Where galvanizing is specified, it shall be hot-dip applied only. Electroplated zinc or cadmium plating is unacceptable.

2.02 FLEXIBLE COUPLINGS

- A. Refer to specific utility section.

2.03 BOLTS AND NUTS

- A. Refer to specific utility section.

2.04 RUBBER GASKETS

- A. Store all rubber gaskets in a cool, well-ventilated place, and do not expose to the direct rays of the sun. Do not allow contact with oils, fuels, or petroleum solvents.
- B. Refer to specific utility section for other details and requirements.

2.05 JOINT LUBRICANT

- A. Furnish joint lubricant with the pipe. Furnish the amount and type recommended by the pipe manufacturer. The lubricant shall be a water-soluble, nontoxic, vegetable soap compound conforming to United States Pharmacopoeia No. P39.

2.06 HYDROSTATIC TESTING

- A. Provide all hoses, plugs, and other necessary equipment to complete the tests.

2.07 CONCRETE FOR THRUST BLOCKING, THRUST TIES AND ENCASEMENT

- A. The concrete for all thrust blocking and thrust ties shall develop a minimum compressive strength of 3,000 psi at 28 days.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Utility Location. Make every effort to identify the location of all existing underground utilities. Contact Utility Locate Service 48-hours in advance of any excavation.

3.03 ELECTRICAL SERVICE

- A. Electrical Service. Contractor to protect existing electrical services as outlined on the Contract Plans. Coordinate with Puget Sound Energy, the Owner, and the Engineer at least three business days in advance of any underground work in the vicinity of the existing electrical services.

3.04 TRENCH EXCAVATION AND BACKFILL

- A. Trench Excavation and Backfill.
 - 1. All trench excavation and backfill shall be performed in accordance with Section 31 23 33 – Trenching and Backfilling.

3.05 SHIPPING AND HANDLING MATERIALS

- A. During transportation, unloading, and storage, pipe and materials shall be protected, supported, and handled in a manner to prevent damage to the materials, especially linings and coatings. Only implements and equipment suitable for proper and safe handling of the materials shall be used. Fabric slings shall be used to lift pipe and fittings, not chains or cables.

3.06 PIPE PREPARATION AND HANDLING

- A. Each pipe and fitting shall be carefully inspected before the exposed pipe or fitting is installed or the buried pipe or fitting is lowered into the trench. The interior and exterior protective coating shall be inspected, and all damaged areas patched in the field with material similar to the original, except damaged glass-lined pipe. Any damaged glass-lined pipe shall not be used and shall be promptly removed from the plant site. Any pipe which, in the opinion of the Engineer, is damaged beyond repair shall be removed from the site and replaced with another unit. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after installation.
- B. Use proper implements, tools, and facilities for the safe and proper protection of the pipe. Carefully handle pipe in such a manner as to avoid any physical damage to the pipe. Do not drop or dump pipe from trucks or into trenches under any circumstances.
- C. All pipe fittings and appurtenances shall be installed in accordance with the manufacturer's instructions and these Specifications.

3.07 CUTTING AND FABRICATING

- A. Cut pipe with approved cutters, do not flame cut except for mild steel pipe. Cut perpendicular to axis of pipe. Dress ends to suit type of joint being made, removing burrs, mill scale, and debris before making up. Repair damaged linings and coatings.

3.08 BELL HOLES

- A. Excavate bell holes at each joint to permit proper assembly and visual and feeler gauge inspection of the entire joint.

3.09 EXPANSION PROVISIONS

- A. Provisions shall be made for the expansion and contraction which may occur in pipe due to temperature change. Pipe expansion provisions may not be detailed on the Drawings. The absence of these details on any Drawing shall not relieve the Contractor of the responsibility for providing them where required, and at his sole expense.

3.010 PIPE IN CONCRETE ENCASEMENTS OR CONCRETE BEDDING

- A. Except for welded joints, pipe joints shall not be encased in concrete unless specifically required on the Drawings. Pipe coatings shall be continuous through concrete

encasements, thrust blocks, anchors, collars, etc., unless otherwise shown on the Drawings.

3.011 FLEXIBLE JOINTS AT CONCRETE BACKFILL OR ENCASEMENT

- A. Except for welded joint pipe, a flexible joint shall be provided within 18 inches or one-half the pipe diameter, whichever is less, from the terminations of any concrete backfill, or concrete encasement.

3.012 SLAB, FLOOR, WALL, AND ROOF PENETRATIONS

- A. All penetrations of new poured-in- place concrete slabs, floors, walls, and roofs shall be poured in place ductile iron wall pipe. It shall be the Contractor's responsibility to verify the size and location of all structure penetrations prior to pouring concrete. All sleeves shall be supported by form work to prevent contact with the reinforcing steel.
- B. Refer also to other utility sections for any additional requirements.

3.013 PIPE WALL PENETRATION SEALS (Through Pre-Cast Concrete)

- A. Penetrations of existing walls, slabs, or roofs shall be constructed by coring and shall have ductile iron wall pipe with a seal installed in the annular space between the pipe and wall opening; see Plan details for seal specification. All penetrations must be leak-free to prevent any potential water intrusion, infiltration or exfiltration.
- B. Penetrations of existing walls, slabs, or roofs which are constructed by breaking out knock-outs will not be accepted. All penetrations must be cored.
- C. Refer also to other utility sections for any additional requirements.

3.014 FLEXIBLE JOINTS AT CONCRETE STRUCTURES

- A. A flexible joint shall be provided near the exterior face of all structures. The joint may be flush with the face, may be up to one half pipe diameter away from the face, but shall not be more than 18 inches away from the face.

3.015 LINE AND GRADE

- A. Grade the bottom of the trench by hand, if necessary, to the line and grade to which the pipe is to be laid, with proper allowance for pipe thickness and for base. Remove hard spots that would prevent a uniform thickness of bedding or cause non-uniform pressure on the pipe barrel.
- B. Lay pipe to a uniform grade between indicated elevations. Do not deviate more than 1 inch from line or 1/4 inch from established grade. Measure for grade at the pipe invert.
- C. Before laying each section of pipe, check the grade with a straightedge and correct any irregularities found. The trench bottom with bedding shall form a continuous and uniform bearing and support for the pipe at every point between bell holes, except that the grade may be disturbed for the removal of lifting tackle.

3.016 PERMISSIBLE DEFLECTION AT JOINTS

- A. Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, do not exceed the amount of deflection recommended by the pipe or coupling manufacturer.

3.017 LAYING AND JOINTING PIPE AND FITTINGS

- A. After a section of pipe has been lowered into the prepared trench with bedding, clean the end of the pipe to be joined, the inside of the joint, and the rubber ring immediately before joining the pipe. Make assembly of the joint in accordance with the recommendations of the manufacturer. Provide all special tools and appliances required for the jointing assembly.
- B. The gasket position shall be checked with a feeler gauge, furnished by the pipe manufacturer, to assure proper seating. After the joint has been made, check pipe for alignment and grade. Provide sufficient pressure in making the joint to assure that the joint is "home", as defined in the standard installation instructions provided by the pipe manufacturer. To assure proper pipe alignment and joint makeup, place sufficient pipe zone material to secure the pipe from movement before the next joint is installed.
- C. Take the necessary precautions required to prevent excavated or other foreign material from entering the pipe during the laying operation. At all times, when laying operations are not in progress, at the close of the day's work, or whenever the workmen are absent from the job, close and block the open end of the last laid section of pipe to prevent entry of foreign material or creep of the gasketed joints.
- D. Take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.
- E. When cutting and/or machining the pipe is necessary, use only tools and methods recommended by the pipe manufacturer.

3.018 UNSUITABLE CONDITIONS FOR LAYING PIPE

- A. Do not lay pipe in water, or when in the opinion of the Engineer, trench conditions are unsuitable.

3.019 PREVENTING TRENCH WATER FROM ENTERING PIPE

- A. When the pipe laying is not in progress, close the open ends of pipe by approved means, and do not permit trench water or other foreign material to enter the pipe. Keep water out of the trench.

3.020 LOCATION OF THRUST RESTRAINT

- A. All pipeline tees, plugs, caps, bends, and other locations where unbalanced forces exist shall be thrust restrained. Thrust blocks and ties are not necessarily shown on the Drawings. The Contractor is responsible for providing thrust restraint as incidental items in the Contract Price.

3.021 THRUST TIES

- A. The Contractor shall install thrust ties at all locations necessary to restrain thrust forces. Such thrust ties are subject to the review and approval of the Engineer. The concrete for all thrust ties shall develop a minimum compressive strength of 3,000 psi at 28 days.

3.022 THRUST BLOCKING

- A. Thrust blocking shall be adequate to withstand hydrostatic test pressures as well as normal operating pressures. Place thrust blocking between undisturbed ground and the fitting to be anchored. Place the blocking so that the pipe and fitting joints will be accessible for repairs. The concrete for all thrust blocks shall develop a minimum compressive strength of 3,000 psi at 28 days.

- B. For gravity or low pressure pipeline, when the bearing surface of the fitting against the soil provides an area equal to or greater than the area required for thrust restraint, concrete thrust blocks are not required. The bearing area for fittings without thrust blocks will be determined by the projected area of 70 percent of the internal diameter multiplied by the chord length for the curve along the centerline of the fitting.

3.023 INSTALLATION OF EXPOSED PIPING

- A. Unless shown otherwise, piping shall be parallel to vault lines. Pipe supports on adjacent piping shall be aligned where possible on common size ranges.
- B. All pipe flanges shall be set level, plumb, and aligned. All flanged fittings shall be true and perpendicular to the axis of the pipe. All bolt holes in flanges shall straddle vertical centerline of pipes.
- C. Unions shall be installed where required for piping or equipment installation, even though they are not shown on the Drawings.
- D. Piping shall be installed without springing or forcing the pipe in a manner which would set up stresses in the pipe, valves, or connected equipment.

3.024 ANCHORAGE AND EXPANSION PROVISIONS

- A. All piping shall be anchored against thrust developed by internal pressures. In addition, provisions shall be made for the expansion and contraction which may occur in pipe due to temperature change. Pipe anchorage and expansion provisions are not completely detailed on the Drawings. The absence of these details on any Drawings shall not relieve the Contractor of the responsibility for providing them where required.

3.025 VENTS AND DRAINS

- A. Vent the high point and drain the low point of all pipelines, whether shown on the Drawings or not, with 3/4-inch gate valves on those pipelines 2-1/2-inch and larger and 1/2-inch gate valves on those pipelines 2-inch and smaller. Valve types shall be selected for the service to be vented and drained.

3.026 INSTALLATION OF FLEXIBLE COUPLINGS, FLANGED COUPLING ADAPTERS, GROOVED JOINT COUPLINGS, AND SERVICE SADDLES

- A. Prior to installation, thoroughly clean oil, scale, rust, and dirt from the pipe to provide a clean seat for the gasket. Care shall be taken that the gaskets are wiped clean before they are installed. If necessary, flexible couplings and flanged coupling adapter gaskets may be lubricated with soapy water or manufacturer's standard lubricant before installation on the pipe ends. Install in accordance with the manufacturer's recommendations. Bolts shall be tightened progressively, drawing up bolts on opposite sides a little at a time until all bolts have a uniform tightness. Workmen tightening bolts shall use torque-limiting wrenches.
- B. Flexible couplings with tie rods may be used to tie pipes against thrust. They shall not be used, with or without tie rods, as expansion joints on pipelines with cyclic temperature changes. Readjust tie rod tension after initial filling before pressure testing.

3.027 CORROSION PROTECTION OF PIPE AND ACCESSORIES

- A. Not all corrosion protection details are included, either on the Drawings or in the Specifications. The absence of specific details on corrosion and environmental protection measures shall not relieve the Contractor of the responsibility of providing them, all as part of the Contract price.

3.028 TESTING

- A. Hydrostatic testing of the discharge lines shall be performed at no less than 225 psi, and as required by other sections and the Plans, with fresh water prior to placing into service. All leaks shall be repaired and re-testing with fresh water shall occur until piping is leak-free.

*****END OF SECTION*****

33 05 63 PRECAST CONCRETE UTILITY STRUCTURES

PART 1. GENERAL

1.01 SUMMARY

- A. The work specified shall include all labor, materials, tools, equipment, services and incidentals necessary to furnish valve and meter vaults, and similar structures, complete with frames and covers, manhole steps and other appurtenances as shown on the Contract Drawings.

1.02 RELATED SECTIONS

- A. Coordinate related work specified in other parts of the Project Manual, including but not limited to following:
 - 1. Section 31 20 00 – Earthwork
 - 2. Section 31 23 33 – Trenching and Backfilling
 - 3. Section 31 50 00 – Excavation Support and Protection
 - 4. Section 33 05 00 – Common Work Results for Utilities
 - 5. Section 33 10 00 – Potable Water Systems
 - 6. Section 33 35 00 – Gravity Sewer Piping
 - 7. Section 33 41 00 – Storm Utility Drainage Piping

1.03 REFERENCES

- A. Comply with the requirements as listed herein.
- B. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, Latest Edition
- C. WSDOT Standard Plans for Road, Bridge and Municipal Construction, Latest Edition
- D. American Water Works Association (AWWA).
- E. ASTM C91 - Standard Specification for Masonry Cement
- F. ASTM C144 - Standard Specification for Aggregate for masonry Mortar
- G. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections
- H. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures
- I. AWWA Standards identified in other related sections
- J. ASTM Standards identified in other related sections
- K. ANSI Standards identified in other related sections
- L. Occupational Safety and Health Administration (OSHA)

1.04 SUBMITTALS

- A. Submittals shall be in accordance with requirements of Section 01 33 00 and as specified. In addition, the following specific information shall be provided:

B. Shop Drawings

1. Prior to any field construction, the CONTRACTOR shall submit review drawings and conformance data for materials to be used in the construction of vaults for review.

1.05 QUALITY ASSURANCE

- A. Quality Assurance shall be in accordance with the requirements of Section 01 44 00 and as specified.

PART 2. PRODUCTS

2.01 GENERAL

- A. All materials and equipment shall comply with "Quality Assurance" provisions and Manufacturer's data. Where these may be in conflict, the more stringent requirements govern.
- B. All materials and equipment shall be compatible with space allocated. Modifications necessary to adjust items to space limitations shall be at Contractor's expense.
- C. All materials and equipment shall conform with conditions shown and specified. Coordinate with other trades for best possible assembly of completed Work.

2.02 PRECAST CONCRETE STRUCTURES

- A. General: the following requirements apply to all precast concrete structures, chambers, and vaults constructed on this project.
1. All precast concrete structures shall be designed by a licensed Washington State registered Professional Engineer. Each drawing for design shall be stamped and signed by the Professional Engineer.
 2. Precast concrete structures shall be manufactured in accordance with ASTM C478, latest revision, and shall be designed for H-30 Live Load, latest revision.
 3. Precast concrete structures shall be of approved design and sufficient strength to withstand the loads to be imposed upon them. An approved watertight joint shall be provided between precast concrete sections.
 4. Mark date of manufacture and name or trademark of manufacturer on inside of precast concrete chamber section.
 5. Sizes of precast concrete structures shall be as shown on the drawings.
 6. All concrete in precast units shall be stone aggregate and develop a strength of 4,000 psi at 28 days and shall conform to the following specifications:
 - a. All concrete furnished and installed for precast concrete vaults shall be in accordance with ACI 318 Code for Reinforced Concrete.
 - b. Materials:
 - (i) Cement: Portland Cement, ASTM C150, Type I or Type II.
 - (ii) Admixtures: Admixtures other than air entraining shall not be used. Air entraining admixture shall conform to ASTM C260. Air content of concrete with ¾-inch maximum size aggregate shall be 6 percent plus or minus 1 percent volume.

- c. Water: Clean and free from injurious amounts of oils, acids, alkalis, organic materials, or other substances.
- d. Aggregates: aggregates shall conform to ASTM C33, latest revision. Coarse aggregate shall be size number 67 (nominal ¾- inch to No. 4).
- e. Proportions of materials in concrete and strength of concrete shall be subject to the following conditions:
 - (i) Minimum 28-day compressive strength – 4,000 psi.
 - (ii) Maximum water to cement ration by weight – 0.45.
 - (iii) Minimum cement content 600 lbs/cubic yard.
- 7. All precast concrete shall be manufactured by wet cast methods only, and shall be approved design.
- 8. All precast concrete shall be reinforced. Reinforcing shall be designed for all applicable loads and forces encountered. Steel reinforcing shall be ASTM A 496-A 615 Grade 60-60 KSI.
- 9. Prior to backfilling, all below grade exterior faces of the concrete structures shall be painted with two coats of sealer. The sealer shall be Bitumastic 300-M, a comparable grade of Carboline, or approved equal.

2.03 CHAMBER, VAULT, AND MANHOLE CONSTRUCTION DETAILS.

- A. Precast concrete chamber, vault, bases, and manholes shall have monolithic reinforced concrete and shall have a keyway type joint between precast concrete sections.
- B. Joint between precast concrete section shall be sealed as recommended by manufacturer and shall be watertight upon completion of joint. Joints shall be buttered inside and outside with 1 to 2 cement brick sand mortar.
- C. Where the proposed piping passes through exterior walls of precast concrete chambers and vaults, the manufacturer shall provide an oversized opening and mechanical type seal or shall provide an assembly consisting of a flexible rubber boot with clamp assembly. The boot assembly shall meet the requirements of ASTM C-923 and shall have a stainless steel power sleeve and clamps.
- D. All precast concrete chambers and vaults shall be furnished with a sump assembly and grating/screen.
- E. Dimensions of precast vaults shall follow those shown on the Drawings.
- F. Product and manufacturer:
 - 1. Oldcastle
 - 2. Or approved equal.

2.04 MISCELLANEOUS METERIALS.

- A. Ladders.
 - 1. For Vaults, provide approved ladders as follows:
 - a. Produce from ASTM A36 steel, galvanized, or FRP.
 - b. Shall have 1-inch diameter rungs spaced a maximum of 12-inch on centers.

- c. Conform to all applicable OSHA 1910.27 requirements for fixed ladders.
 - d. Designed for a single concentrated load of 200 pounds minimum.
 - e. Minimum ladder width of 16 inches.
 - f. Length as required to extend from underside of slab to top of floor.
 - g. Shall be attached to wall with galvanized steel hardware suitable for all loads imposed upon them and as recommended by the ladder manufacturer.
 - h. All ladders shall have a dismount system that enables the climber to safely dismount the vaults.
- B. Locking Steel Cover Assembly
 - 1. Hatch cover shall be the size and configuration indicated in the Drawings.
 - 2. All Hatch cover Assemblies shall be rated for direct heavy-duty traffic loading, H-20.
- C. Cement Grouts:
 - 1. Shall be in accordance with LWWSD Standard Detail S1, and as shown on the Plans.
- D. Sealant Gaskets:
 - 1. The sealant gaskets shall be preformed, continuous rope form plastic material, protected by a removable two-piece wrapper.
 - 2. Sealing compound shall be reinforced hydrocarbon resins blended with plasticizing compounds and reinforced with inert mineral filler. The sealing compound shall have no solvents, irritating fumes or obnoxious odors.
 - 3. The adhesive and cohesive strength of the sealant gaskets shall not be dependent upon oxidizing, evaporating or chemical action.
 - 4. Sealant Gasket shall conform to Federal Specification SS-S-210.
 - 5. Sealant gaskets shall be RAM-NEK as manufactured by K.T. Snyder Company, Inc. of Houston, TX; QUIKSEAL as supplied by Associated Concrete Products, Santa Ana, CA; or approved equal.
- E. External Precast Vault Joint Sleeves:
 - 1. Joint sleeves shall be heat-shrinkable sleeves constructed of irradiated and cross-linked polyethylene impermeable backing coated with protective heat-activated adhesive.
 - 2. Joint sleeves shall be capable of bonding to primed concrete, metal, and fiberglass surfaces.
 - 3. Joint sleeve material shall be compatible with concrete, steel, iron, and fiberglass.
 - 4. Joint sleeves shall be supplied with a separate closure seal to secure sleeve in place during installation and seal overlap area.
 - 5. Joint sleeve primer of the same manufacturer as the joint sleeve material shall be provided to prime concrete and steel surfaces prior to joint sleeve installation.

6. Joint sleeves shall be WrapidSeal Manhole Encapsulation System as manufactured by Canusa, Division of Shaw Resource Services, Inc. of The Woodlands, TX.; or approved equal.
- F. Adhesive Doweling Accessories:
1. Accepted products include:
 - a. ITW-Ramset Epcon system with “Ceramic 6” polymer adhesive
 - b. Hilti HVA adhesive anchor system with HEA adhesive capsule
 - c. Hilti HAS threaded rods in Hilti C-100 adhesive
 2. Adhesive dowels shall have minimum embedment of 12 bolt diameters, unless noted otherwise on drawings. The hole diameter and roughness shall be per manufacturer’s instructions; thoroughly clean hole before installation.

PART 3. EXECUTION

3.01 SHIPPING AND HANDLING OF MATERIALS:

- A. During transportation, unloading, and storage, pipe and materials shall be protected, supported, and handled in a manner to prevent damage to the materials, especially linings and coatings. Only implements and equipment suitable for proper and safe handling of the materials shall be used. Fabric slings shall be used to lift pipe and fittings, not chains or cables.

3.02 EXAMINATION

- A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. Install in accordance with “Quality Assurance” provisions, “References,” Specifications, and Manufacturer’s recommendations. Where these may be in conflict, the more stringent requirements govern.
- B. All work and materials shall be subject to the approval of the Engineer and the Owner.

3.04 INSTALLATION

- A. Precast Sections
1. Precast section shall be installed level on a flat stable subgrade. Where an unstable condition exists, the CONTRACTOR shall excavate the unstable material and replace with compacted granular material.
 2. Vaults shall be placed on minimum 12-inches thick CSBC per WSDOT 9-03.9(3) as shown on the Plans, and shall extend out beyond the edge of the vault bottom at a 1H:1V.
 3. All joints shall be filled inside and out with mortar to provide a smooth and continuous surface.

- B. Benchwalls and Inverts
 - 1. Mortar surfaces of benchwalls and concrete floors shall be given a broom finish.
- C. Frames and Castings
 - 1. Frames and castings shall be set in a full bed of mortar a maximum of $\frac{1}{2}$ " thick. Where required to adjust the frames and castings to grade there shall be installed to a maximum of four brick courses.
- D. Steps
 - 1. Steps shall be installed in vertical alignment spaced 12-inches on center.
 - 2. In concrete sections the steps shall be cast into the section or secured with cadmium plated bolts to threaded inserts which are precast into the concrete.
 - 3. In masonry construction the steps shall be built into the masonry walls.
- E. Plastering
 - 1. Plaster shall be with mortar not less than 2-inch thick and troweled smooth.
 - 2. Outside of masonry structures.
 - 3. Inside and outside of brick courses under frames and castings.
- F. Sumps
 - 1. Sumps of the size specified shall be built into the floors of vaults and similar structures. Floors shall be sloped to the sump.
- G. Lifting holes shall be sealed tight with a solid rubber plug driven into hole and remaining void filled with a mix of 1 part cement and 2 part sand mortar.
- H. All precast concrete structures shall be free from visible leakage: each structure shall be tested for leaks and inspected and all leaks shall be repaired in a manner subject to the ENGINEER'S approval.

*****END OF SECTION*****

SECTION 33 10 00 – POTABLE WATER SYSTEMS

PART 1. GENERAL

1.01 SUMMARY

- A. Work includes but is not limited to following:
 - 1. Installation of DI water main and appurtenances;
 - 2. Chlorination, de-chlorination, pressure testing and start-up of water mains and water services;
 - 3. Recording as-built information and preparation of record (as-built) drawings in accordance with Section 01 70 00;
- B. Contractor shall provide a complete working installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or specified is clearly necessary for proper operation of equipment shown or specified, provide an item which will allow the system to function properly at no increase in Contract Sum.
- C. Piping systems, including pipe, fittings, anchors, and all other elements, shall be detailed, fabricated, and installed to resist all internal and external loads which will be imposed upon them. Pressure ratings and materials stated in these Piping Specification sections are minimum acceptable standards. Systems shall be suitable for the service intended.
- D. The pipe diameters shown on the Drawings and used in these Specifications are inside diameters unless specific reference is made to outside diameter of the pipe or the pipe is a standardized product normally designated by a nominal size, e.g., ductile iron pipe.
- E. The Contractor shall furnish and install pipe and fittings as shown on the Drawings, as specified in these Specifications, and as required for a complete and functional installation. The pipe shall be new, manufactured in accordance with these Specifications and Drawings.

1.02 RELATED SECTIONS

- A. Coordinate related work specified in other parts of the Project Manual, including but not limited to following:
 - 1. Section 31 20 00 Earth Moving
 - 2. Section 31 23 33 Trench Excavation and Backfill
 - 3. Section 33 05 00 Common Works Results for Utilities
 - 4. Section 33 05 63 Precast Concrete Utility Structures
 - 5. Section 33 16 33 Concrete Water Reservoirs

1.03 REFERENCES

- A. Comply with the requirements of Section 01 41 00 Regulatory Requirements, and as listed herein.
- B. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, Latest Edition.

- C. WSDOT Standard Plans for Road, Bridge and Municipal Construction, Latest Edition.
- D. American Water Works Association (AWWA).
- E. Lake Whatcom Water and Sewer District Design and Construction Standards, February 23, 2022 or latest edition.

1.04 SUBMITTALS

- A. Submittals shall be in accordance with requirements of Section 01 33 00 and as specified. In addition, the following specific information shall be provided:
 - 1. Field Fabrication

For pipe lines which are assembled in the field from standard fittings, submit complete data on pipe and fittings, including any manufacturer's installation instructions.
 - 2. Material Certification

Certification of all materials and manufacturing, properly executed by the manufacturer, shall be available to show compliance with the Specification of materials being furnished. Test data on tests performed shall be provided as requested by the Engineer.
- B. Submittals for all pipe and appurtenances (fittings, valves, air/vac, valve boxes, hydrants, blow-offs, services and appurtenances)
- C. The Contractor shall submit a water main shut-down / temporary bypass plan prior to performing Work. The plan shall include an anticipated schedule for shut-downs, schedule for notification of customers (construction notice, shut-down notice), sample notification (letter, door hanger). Customers shall be notified about construction activities one week in advance and water shut-downs at least 24-hours in advance. This plan shall also include the contingency provisions the Contractor will have in place to provide water to residential customers in the event that a shut-down lasts longer than 6-hours.

1.05 QUALITY ASSURANCE

- A. Quality Assurance shall be in accordance with the requirements of Section 01 44 00 and as specified.
- B. Installer shall be a Specialist and experienced in the installation of potable water systems.
- C. Regulatory Requirements: See referenced Codes, ordinances, and standards in Section 01 41 00 Regulatory Requirements.

1.06 PROJECT SITE CONDITIONS

- A. Locate and provide protection of existing utilities affected by the work.
 - 1. Existing Pipe Verification

Expose all existing pipes which are to be connected to new pipelines. Verify the size, material, elevation, horizontal location, and pipe service of these existing pipes with sufficient lead time to make accommodations as necessary. Connections to the existing pipe system shall be at a restrained joint or fitting.
- B. Minimize disruptions to access, existing water service connections and existing facilities.

PART 2. PRODUCTS

2.01 GENERAL

- A. All materials and equipment shall comply with "Quality Assurance" provisions and Manufacturer's data. Where these may be in conflict, the more stringent requirements govern.
- B. All items of materials in each category of equipment shall be of one manufacturer.
- C. Groups of items having same or similar function shall be by single manufacturer to facilitate maintenance and service.
- D. All materials and equipment shall be compatible with space allocated. Modifications necessary to adjust items to space limitations shall be at Contractor's expense.
- E. All materials and equipment shall conform with conditions shown and specified. Coordinate with other trades for best possible assembly of completed Work.
- F. All materials and equipment installed shall be fully operational and without objectionable noise or vibration.

2.02 PIPE AND JOINTS

- A. Buried Water Main Pipe
 - 1. Ductile iron potable water piping shall be Class 52 (AWWA C-151) with cement mortar lining (AWWA C-104). Fittings shall be ductile iron (AWWA C-110 or AWWA C-153). Buried ductile iron pipe and fittings shall be polyethylene encased in accordance with pipe manufacturer's recommendations and WSDOT 9-30.1(2).
 - 2. All ductile iron pipe push-on joints shall be restrained with U.S. Pipe FIELD LOK 350 Gaskets, or approved equal.

2.03 MISCELLANEOUS PIPES

- A. Other types of piping required for appurtenances including blow off assemblies, combination air release / air vacuum assemblies, reservoir sample stations, etc. shall be as shown on the Plans.

2.04 PIPE FITTINGS

- A. Ductile iron pipe fittings (reducers, bends, elbows, etc.) shall be cast or ductile iron in accordance with WSDOT 9-30.2(1) and ANSI B16.1/AWWA C110, short body type, 250 psi working pressure.

2.05 COUPLINGS / MECHANICAL JOINTS

- A. Flexible couplings for use with ductile iron pipe shall be Romac Style 501; or approved equal. Bolts and nuts shall be stainless steel type 316. Center ring shall have fusion bonded epoxy coating and have a length of 2x the pipe diameter. Ductile iron sleeves with mechanical joints at each end may be substituted for flexible couplings on ductile iron pipe. Mechanical joint shall be Romagrip, EBAA Iron Megalug 1100, Star Pipe Products Stargrip Series 3000, or approved equal.
- B. Restrained flexible couplings shall use Romac 611 Restraining System or approved equal.
- C. Joint Restraint: Provide joint harnesses (tie rod lug or attachment plate assemblies) designed for the test pressure across flexible couplings and flange coupling adaptors.

Provide wedge-style restraint systems for restrained mechanical joints, EBAA Iron 110 Megalug, Romac Romagrip, or approved equal.

- D. Restrained Flange Coupling Adapter: Romac RFCA, Romac Alpha FC, EBAA Iron Series 2100 MEGAFLANGE Restrained Flange Adapter, or approved equal. Coating shall be fusion epoxy.
- E. Protection for Buried Couplings and Adaptors:
 - 1. Double wrap with polyethylene encasement, AWWA C105 and tape the edges of the encasement with PVC tape.

2.06 BOLTS AND NUTS

- A. Bolts and nuts shall be Type 316 stainless steel.

2.07 RUBBER GASKETS

- A. Store all rubber gaskets in a cool, well-ventilated place, and do not expose to the direct rays of the sun. Do not allow contact with oils, fuels, or petroleum solvents.

2.08 JOINT LUBRICANT

- A. Furnish joint lubricant with the pipe. Furnish the amount and type recommended by the pipe manufacturer. The lubricant shall be a water-soluble, nontoxic, vegetable soap compound conforming to United States Pharmacopoeia No. P39.

2.09 HYDROSTATIC TESTING

- A. Provide all hoses, plugs, and other necessary equipment to complete the tests.

2.010 CONCRETE FOR THRUST BLOCKING, THRUST TIES AND ENCASEMENT

- A. The concrete for all thrust blocking and thrust ties shall develop a minimum compressive strength of 3,000 psi at 28 days.

2.011 VALVE OPERATORS

- A. All valve operators shall open by turning counterclockwise. Buried valve operators with 2-inch nuts shall have AWWA C504 2-inch square operating nuts and be full enclosed, grease packed. Depending upon valve type, size, and operating torques, gear operators shall be provided as needed so as to permit operation of the valve under full operating head with a maximum pull of 40 pounds on the handwheel. The valve operators shall be of the self-locking type to prevent the disc or plug from creeping. Self-locking worm gears shall be a one-piece design of gear bronze material, accurately machine cut. Butterfly valve operators shall be provided with position indicators to show the position of the valve disc or plug. Handwheels shall be galvanized and painted the same color as the valve and associated pipeline.
- B. All operating nuts for buried valves are to be located within 3 feet of finished grade and with valve boxes. Provide stem extensions as needed.
- C. Operators for above ground valves and valves in vaults unless otherwise noted on drawings:
 - 1. All exposed above ground valves 4" or smaller shall have direct-acting lever or handwheel operators on valves within 6 feet of the floor and chainwheel operators on overhead valves.
 - 2. All exposed above ground valves 4" or larger shall have handwheel operators on valves within 6 feet of the floor and chainwheel operators on overhead valves.

- D. Operators for Below Ground Valves unless otherwise noted on drawings:
 - 1. 6" and smaller valves shall be provided with direct 2-inch nut operator.
 - 2. 6" and smaller valves used for flow control shall be provided with worm gear type manual actuators and shall be suited for buried service with 2" nut operator.
 - 3. 8" and larger valves shall be provided with gear type manual actuators and shall be suited for buried service with 2" nut operator.

2.012 VALVE BOXES

- A. Valve boxes shall be two-piece slip type, cast iron, with min. 5-1/4-inch shaft and shall be of appropriate length for the installation. Extension pieces, if required, shall be the manufacturer's standard type. Units shall be Mueller H-10364, Clow Corporation F-2452, or equal. All units shall be complete with all necessary bases and accessories. All buried valves are to be provided with valve box assemblies unless located in a vault per plans.

2.013 GATE VALVES

- A. 2" to 12" gate valves shall be Kennedy Valve or approved equal. Gate valves shall be non-rising stem, resilient-seated, conforming to AWWA C509 or C515, transition gaskets where needed, fusion bonded epoxy coated inside and out meeting AWWA C550. Nut actuated for buried applications, handwheel actuated within vault.

2.014 INSERTION VALVES

- A. 4" to 14" insertion valves shall be Advanced Valve Technologies AVT EZ Valve, standard open left, for CI/DI pipe. Shall include all materials and equipment for gate build up for over size pipe IDs as needed.
- B. Contractor shall be responsible for determining and coordinating with the supplier regarding existing pipe outside and inside diameters.
- C. Insertion valves shall be installed only by a Certified Installer.

2.015 CHECK VALVES

- A. 12" Check valves shall be Globe Style Silent Check Valves, Val-Matic Series #1800A, or approved equal, ANSI Class 125, NSF/ANSI 61 certified. Seat shall include a resilient seal to provide zero leakage at both high and low pressures without overloading or damaging the seal. Valve interiors and exteriors shall be coated with an NSF/ANSI 61 certified fusion bonded epoxy in accordance with AWWA C550.
- B. See Section 33 16 33 for check valve on inflow pipe on water storage tank interior.

2.016 BUTTERFLY VALVE AND ACTUATOR

- A. 12" Butterfly valves shall be AWWA C504 Class 150B Flanged butterfly valves, Val-Matic Series #2000, or approved equal, conforming to AWWA Standards ANSI/AWWA C504 and C516, NSF/ANSI 61 certified. Valve stem shall be bare and appropriate for operation with the electric motor actuator specified for the project. Cast iron body, ductile iron disc, stainless steel shaft and body seat ring, resilient seat. Valve interior and exterior coated with an NSF/ANSI 61 fusion bonded epoxy coating approved for potable water.
- B. The electric motor actuator shall be Rotork IQT1000 mk3 Intelligent Actuator with the following features:
 - 1. Watertight enclosure,

2. FA14 output flange,
 3. 24VDC power supply,
 4. 24VDC Indication power,
 5. Open/Close operation,
 6. 60 starts/stops per hour,
 7. Isolating control,
 8. 738 ft-lbs available torque,
 9. 30 to 120 second stroke time,
 10. S1-S4 programmable relays,
- C. The butterfly valve and electric motor actuator shall be provided by the same supplier to ensure compatibility and final product combination for intended use and purpose in conformance with the Plans and Specifications.
- D. Coordinate electric motor actuator with installations and requirements of the electrical and controls Plans and Specifications.

2.017 SMALL BALL VALVES

- A. INTERIOR POTABLE WATER USAGE: Ball valves 2" and smaller shall be Watts LFB6080G2-SS, or approved equal. Valves shall be manual operation, meet NSF 60/61 certification, and rated for 200 psi minimum. Construction shall be of bronze, seat of PTFE, and O rings of FKM.

2.018 COMBINATION AIR RELEASE/VACUUM VALVES

- A. Materials and installation as shown on the Plans and in accordance with manufacturer's recommendations.

2.019 BLOWOFF ASSEMBLIES

- A. Materials and installation as shown on the Plans and in accordance with manufacturer's recommendations.

2.020 TRACER WIRE

- A. Materials and installation as shown on the Plans and in accordance with manufacturer's recommendations.

2.021 DETECTABLE MARKING TAPE / METALLIC DETECTOR TAPE

- A. Detectable marking tape shall be per WSDOT 9-15.18, marked Water and color Blue.
- B. Width of tape shall be 2-inches and installed as shown on Plan details.

2.022 FLEXIBLE EXPANSION JOINTS

- A. Flexible expansion joints shall be force balanced flexible expansion joints that will not impart a thrust force while under internal pressure, EBAA Iron Inc. Force Balanced Flex-Tend, or approved equal. Flexible expansion joints shall:
1. Be manufactured of ductile iron conforming to ASTM A536 and ANSI/AWWA C153/A21.53.
 2. Be pressure tested prior to shipment against its own restraint to a minimum of 350 psi.

3. Consist of an expansion joint designed and cast as an integral part of a ball and socket type flexible joint, having a minimum per ball deflection of 20 degrees. The flexible expansion fitting shall not expand or exert an axial imparting thrust under internal water pressure. The flexible expansion fitting shall not increase or decrease the internal water volume as the unit expands or contracts. The minimum total linear travel shall be 8-inches.
4. All internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213. Sealing gaskets shall be construed of EPDM. The coating shall meet NSF/NSF-61.
5. Exterior surfaces shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.
6. Polyethylene sleeves, meeting ANSI/AWWA C15/A21.5 shall be included for direct buried applications.
7. Manufacturer's certification of compliance to the above standards and requirements shall be readily available upon request.

2.023 PIPE SUPPORTS

- A. Pipe supports shall be made of 100% Hot Dipped Galvanized Steel or Stainless Steel. Saddle-style pipe supports shall use a neoprene gasket between the support and the pipe so that there is no metal-to-metal contact between the support and the pipe. Saddle-style pipe supports to provide sufficient support area under the pipe that undue stresses are not imposed on the pipe (band-style, not u-bolt style). Pipe supports shall be of an appropriate style for the pipe being supported and the installation method – either saddle-style or flange support style is acceptable.
 - a. Pipe supports shall be manufactured by Standon, Anvil, or an approved equivalent.
- B. Note that pipe supports are shown on some drawings but are not necessarily shown in every location they are needed. Contractor to install sufficient pipe supports as needed for all piping systems.

PART 3. EXECUTION

3.01 SHIPPING AND HANDLING OF MATERIALS:

- A. During transportation, unloading, and storage, pipe and materials shall be protected, supported, and handled in a manner to prevent damage to the materials, especially linings and coatings. Only implements and equipment suitable for proper and safe handling of the materials shall be used. Fabric slings shall be used to lift pipe and fittings, not chains or cables.

3.02 EXAMINATION

- A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. Install in accordance with "Quality Assurance" provisions, "References," Specifications,

and Manufacturer's recommendations. Where these may be in conflict, the more stringent requirements govern.

- B. All work and materials shall be subject to the approval of the Engineer and the Owner.

3.04 INSTALLATION OF PIPING AND VALVE IMPROVEMENTS

- A. Line and Grade.

1. Survey line and grade shall be established prior to laying pipe per Standard Specification 7-09.3(5). Construction layout staking, if required, shall be provided by the Contractor.
2. In areas between survey stakes, transfer line and grade from the Plans to the water line trench and maintain said line and grade using construction practices in conformance with established industry standards.

- B. Handling, Storage and Cutting of Pipe.

1. During transportation, unloading, and storage, pipe and materials shall be protected, supported, and handled in a manner to prevent damage to the materials, especially linings and coatings. Only implements and equipment suitable for proper and safe handling of the materials shall be used. Fabric slings shall be used to lift pipe and fittings, not chains or cables.
2. Each pipe and fitting shall be carefully inspected before the exposed pipe or fitting is installed or the buried pipe or fitting is lowered into the trench. The interior and exterior protective coating shall be inspected, and all damaged areas patched in the field with material similar to the original. Any pipe which, in the opinion of the Engineer, is damaged beyond repair shall be removed from the site and replaced with another unit. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after installation.
3. Use proper implements, tools, and facilities for the safe and proper protection of the pipe. Carefully handle pipe in such a manner as to avoid any physical damage to the pipe. Do not drop or dump pipe from trucks or into trenches under any circumstances.
4. Cut pipe with approved cutters, do not flame cut except for mild steel pipe. Cut perpendicular to axis of pipe. Dress ends to suit type of joint being made, removing burrs, mill scale, and debris before making up. Repair damaged linings and coatings.

- C. Pipe Installation.

1. All pipe shall be installed in conformance with the manufacturer's recommended procedures for the particular pipe being installed, and in accordance with WSDOT Standard Specifications 7-08 and 7-09. A minimum of 3 feet of cover above the top of pipe shall be provided. Take precautions to prevent water from entering the trench or excavation. Do not lay pipe in water, or when in the opinion of the Owner or Engineer, trench conditions are unsuitable. Prevent excavated or other foreign material from entering the pipe during the laying operation. When laying operations are not in progress, at the close of the day's work, or when labor is absent from the job, close and block all open pipe ends to prevent entry of foreign material or creep of the gasketed joints.

2. Excavating and Backfilling: In accordance with requirements of WSDOT Division 2 and Sections of these Specifications. Provide all necessary shoring, sheeting, and pumping as part of Work of this Division.
 3. Bedding: See Section 31 23 33 - Trench Excavation and Backfill.
 4. Pipe Laying: After a section of pipe has been lowered into the prepared trench, clean the end of the pipe to be joined, the inside of the joint, and the rubber ring immediately before joining the pipe. Make assembly of the joint in accordance with the recommendations of the manufacturer. Provide all special tools and appliances required for the jointing assembly. All water pipe shall be installed with the bell end upstream. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with an approved temporary plug. All pipe laid in the trench to the specified line shall be kept under longitudinal compression until the backfill has been compacted to the crown of the pipe. Take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation. Where field conditions prevent installation per the Plan line, notify the engineer immediately. The joint deflection between segments of the water main shall not exceed 75% of the manufacturer's recommended maximum deflection. Where joint deflection exceeds this limit, install the needed fittings to make the needed horizontal or vertical bend.
 5. Contractor shall mark all underground water mains and any appurtenance lines with detector tape and tracer wire in accordance with the Plans and these Specifications.
- D. Joining Flanged Pipe:
1. Prior to connecting flanged pipe, the faces of the flanges shall be thoroughly cleaned of all oil, grease, and foreign material. The gaskets shall be checked for proper fit and thoroughly cleaned. Care shall be taken to assure proper seating of the flange gasket. Bolts shall be tightened so that the pressure on the gasket is uniform. Torque-limiting wrenches shall be used to ensure uniform bearing insofar as possible. If joints leak when the hydrostatic test is applied, the gaskets shall be removed and reset and bolts retightened.
- E. Except for welded joints, pipe joints shall not be encased in concrete unless specifically required on the Drawings. Pipe coatings shall be continuous through concrete encasements, thrust blocks, anchors, collars, etc., unless otherwise shown on the Drawings.
- F. Except for welded joint pipe, a flexible joint shall be provided within 18 inches or one-half the pipe diameter, whichever is less, from the terminations of any concrete backfill, or concrete encasement.
- G. Corrosion Protection of Pipe and Accessories:
1. Not all corrosion protection details are included, either on the Drawings or in the Specifications. The absence of specific details on corrosion and environmental protection measures shall not relieve the Contractor of the responsibility of providing them, all as part of the Contract price.
- H. Corrosion Protection for Buried Pipe Accessories:
1. All buried pipe appurtenances made of steel shall have corrosion protection. Tie rods and similar items shall be heat shrink tube wrapped. Flange bolts, nuts, and

similar items shall be coated with a bituminous paint or equal. Flexible couplings, grooved couplings, and similar items shall be heat shrink wrapped or cement coated.

2. Buried valves and similar elements on wrapped pipelines shall be bituminous paint-coated. On ductile iron or nonmetallic pipelines they shall have exposed nuts and bolts bituminous paint-coated and the entire valve wrapped in 8-mil polyethylene as specified for ductile iron pipe. On cement-coated pipelines they shall be cement-coated similar to detail shown for couplings.

I. Thrust Restraint:

1. All pipeline tees, plugs, caps, bends, and other locations where unbalanced forces exist shall be thrust restrained. Thrust blocks and ties may not be shown on the Drawings. The Contractor is responsible for providing thrust restraint as incidental items in the Contract Price.
2. The Contractor shall install thrust ties at all locations necessary to restrain thrust forces. Such thrust ties are subject to the review and approval of the Engineer. The concrete for all thrust ties shall develop a minimum compressive strength of 3,000 psi at 28 days.
3. Thrust blocking shall be adequate to withstand hydrostatic test pressures as well as normal operating pressures. Place thrust blocking between undisturbed ground and the fitting to be anchored. Place the blocking so that the pipe and fitting joints will be accessible for repairs. The concrete for all thrust blocks shall develop a minimum compressive strength of 3,000 psi at 28 days.

J. Interface with other products:

1. Exact routing of piping and other items shall be governed by structural conditions or obstruction. Contractor shall make use of data in Contract Documents. In addition, Engineer reserves right, at no increase in Contract Sum, to make any reasonable change in location of pipe and appurtenances.
2. Field verify all dimensions shown on the drawings prior to starting any work. The Contractor shall not be entitled to additional compensation for minor variations in the field dimensions of the existing facilities.

K. Valve Installation:

1. Gate valves and combination air-release/vacuum relief valves shall be installed in accordance with WSDOT Section 7-12. Stems shall be vertical and upright. Solidly support valves in compacted bedding material or valve chairs. All other valves shall be installed as shown on the plans and in accordance with the manufacturers' specifications and the Plans.
2. Provide and install cast iron valve box with each underground valve installed. The axis of the valve box shall be common with the axis projected off the valve stem. The top of the adjustable valve box shall be set to match finished grade for each valve location.
3. Provide and install meter boxes or vaults for all combination air-release/vacuum relief valves. The top of the box/vault shall be set to match finished grade for each valve location.

L. Tracer Wire Installation and Testing:

1. Tracer wire installation shall be performed in such a manner that allows proper access for connection of line tracing equipment, proper locating of wire without loss or deterioration of low frequency (512Hz) signal for distances in excess of 1,000 linear feet, and without distortion of signal caused by multiple wires being installed in close proximity to one another.
2. Tracer wire systems must be installed as a single continuous wire between access points, except where using approved connectors only as absolutely necessary.
3. Any damage occurring during installation of the tracer wire must be immediately repaired by removing the damaged wire, and installing a new section of wire with approved connectors. Taping and/or spray coating shall not be allowed.
4. Tracer wire shall be installed at the bottom half of the pipe and secured (taped/tied) at 5-ft intervals, or as approved by Owner.
5. Tracer wire on all service laterals must terminate in the meter box.
6. At all mainline dead-ends tracer wire shall terminate in access box.
7. In occurrences where an existing tracer wire is encountered on an existing utility that is being extended or tied into, the new tracer wire and existing tracer wire shall be connected using approved splice connectors.
8. All new tracer wire installations shall be located using typical low frequency (512Hz) line tracing equipment provided and performed by the Contractor. Testing shall be witnessed by the Owner and Engineer prior to acceptance of the project.

3.05 TESTING AND DISINFECTION

- A. All pressure testing and disinfection shall be in accordance with LWWS D Standard Details W1 and W2 Water System Notes as shown on the Plans.

3.06 CONNECTION TO EXISTING SYSTEM

- A. Only District staff shall operate the isolation valves on the existing system.
- B. Contractor shall coordinate with the Owner ahead of time to provide 48-hour written notice to customers for water shut-off. Notification shall be by means of Contractor notifying and coordinating with the Owner for each residence or place of business to which service will be disrupted. The Owner will provide and distribute door hangers to the customers being impacted. It will be the responsibility of the Contractor to plan for and coordinate with the Owner to fill-in the specific temporary service shut-down information which shall include, at a minimum, the proposed date and time of service disconnection.
- C. Note that service shutdowns are limited to 8am-4pm, Monday – Thursday only.
- D. Any support provided by the Owner’s staff shall be subject to preemption by emergency operations including, but not limited to, power outages and water main breaks.

*****END OF SECTION*****

SECTION 33 16 33 CONCRETE WATER RESERVOIRS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Work under this section includes the complete installation of two water storage tanks, site preparation and appurtenances. The intent of this section is to provide two each of 237,900 gallons storage facility with an inside diameter of 30-ft and maximum interior height of 45 ft. This section provides details for a cast-in-place concrete tank, in all cases the tank fabricator/contractor is responsible for conforming to the intent of this section and the plans.

1.02 REFERENCED SECTIONS

- A. Other Sections, not referenced below, may also be related to the proper performance of this work. It is the Contractor's responsibility to perform all the work required by the Contract Documents.

1.03 REFERENCE STANDARDS

- A. IBC Latest Edition
- B. Washington State DOT Standard Specifications, Latest Edition
- C. 10 STATE STANDARDS – Recommended Standards for Water Works, Latest Edition – Policies for the Review and Approval of Plans and Specifications for Public Water Supplies
- D. AWWA Standard for Tanks for Water Storage.
- E. American National Standards Institute (ANSI).
- F. Occupational Safety and Health Administration Standards (OSHA) with current amendments.
- G. National Sanitation Foundation (NSF).

1.04 QUALITY ASSURANCE

- A. Referenced Standards: This Section incorporates by reference the latest revision of the following document. These references are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and that of the listed document, the requirements of this Section shall prevail.
- B. The Contractor shall have the experience and knowledge necessary to furnish and erect the highest quality of tank possible. Under no circumstances shall an inexperienced Contractor be awarded the project. The Contractor shall be fully responsible for the entire installation including excavation, foundation preparation, foundation, piping, steel erection, appurtenances and the final product.
- C. Materials Testing: Owner will engage a materials testing laboratory to perform reinforcement rebar inspection and concrete testing for the reservoir construction. Contractor shall provide cooperation, complete access, and necessary scheduling information to the Owner's testing laboratory.

- D. The Contractor shall designate one experienced person from his organization to act as the job superintendent. The job superintendent shall be at the job site full time during all phases of construction and he shall have the ultimate responsibility for the construction according to the specifications. The job superintendent shall be authorized by the tank manufacturer and he shall have the experience of erecting at least five tanks. Such tanks shall have had no leakage problems.
- E. The tank contractor shall have completed a minimum of ten (10) tanks presently in service and operating properly, which the supplier has designed, fabricated, and erected, of similar design and type, during the last five years. At least two (2) of the tanks shall have been constructed in locations subject to the same seismic design requirements. A listing of the tanks shall be submitted to the Engineer, including the contacts and phone numbers for each project.
- F. The Owner and/or Engineer reserve the right to reject any bid which, in the opinion of the Engineer, does not meet the full qualification requirements as set forth. Past poor performance of similar tanks will be just cause for rejecting any bid.

1.05 SUBMITTALS

- A. Procedures: Section 01 33 00.
- B. The Owner has already paid for and obtained detailed erection drawings, detail drawings, and complete set of structural calculations for the tank structure and foundation which were prepared by the anticipated tank supplier (Baker Silo), stamped by a Registered Professional Engineer employed by the tank manufacturer, to obtain permits for the project. The tank supplier's structural drawings and details are included in the Plans.

If an alternative tank supplier is proposed, then the following provisions apply:

- 1. Construction shall be governed by the Owner's drawings and specifications showing general dimensions and construction details, after written approval by the Engineer of detailed erection drawings prepared by the tank bidder. There shall be no deviation from the drawings and specifications, except upon written order from the Engineer.
- 2. The bidder is required to furnish, for the approval of the Engineer and at no increase in contract price, one digital copy set of complete specifications and construction drawings for all work not shown in complete detail on the bidding drawings. A complete set of structural calculations shall be provided for the tank structure and foundation. All such submissions shall be stamped by a Registered Professional Engineer licensed in the state of project location, as well as by a Registered Professional Engineer employed on the tank manufacturer's engineering staff.
- 3. When approved, the submittal information will be returned to the bidder marked "APPROVED FOR CONSTRUCTION" and these drawings will then govern for the work detailed thereon. The approval by the Engineer of the tank supplier's drawings shall be an approval relating only to their general conformity with the bidding drawings and specifications and shall not guarantee detail dimensions and quantities.
- C. The tank manufacturer's standard published warranty shall be included with submittal information.
- D. The tank manufacturer shall provide a letter certifying the cleaning and disinfection procedures used on the completed storage tanks.

PART 2 - PRODUCTS

2.01 TANK

- A. Tank shall be designed in accordance with the most current edition of the following codes: IBC, ASCE 7, ACI 318, ACI 350, ACI 350.3, AWWA D-110 and AWWA D-115.
- B. Refer also to the Plans and the Structural Notes on the Structural Drawings in the Plans. In the case of any conflicting requirements, the more stringent shall apply.
- C. Concrete shall conform to the following:
 - 1. Cement used shall be standard Portland Cement, Type 1. It shall contain a minimum of 6 sacks cement per cubic yard and shall have a 28-day minimum compressive strength of 4,500 psi.
 - 2. Aggregate:
 - a. Maximum aggregate size shall be 1 ½" for the base unless otherwise noted.
 - b. Maximum aggregate size be ¾" for wall pours. In the event that ¾" rock is not available, the closest available size approximating ¾" shall be used.
 - 3. Slump: 3.5-4.5". If additives such as air entrainment, water reducing agents, super plasticizers are used, the allowable slump may be correspondingly higher. Not to exceed 9".
 - 4. Air Entrainment: 4.5 – 7.5%
 - 5. W/C ratio: 0.42+/-.
 - 6. Curing: After placement, the concrete shall be sprayed with an approved curing compound.
 - 7. Testing: A minimum of 6 test cylinders shall be cast for each 50 CY. (See General 6.g.) The cylinders shall be tested by a certified testing lab and each set of cylinders shall be tested per the following table:

One Cylinder @ 7 days

Three Cylinders @ 28 days

Two Cylinders @ 56 days
- D. Reinforcing Steel:
 - 1. All reinforcing steel shall conform with ASTM specification A615, Grade 60, having a minimum yield stress of 60,000 psi.
 - 2. Bars shall be free from loose scale, dirt, grease, or any other substance which will impair the bond between the concrete and reinforcing bars.
 - 3. Tie Wire – Tie wire shall be steel, black annealed, 16 gauge minimum.
- E. Water Stop:
 - 1. Waterstop shall be installed in all construction joints below water level.
 - 2. Waterstop shall be spliced per manufacturer's recommendations or lapped a minimum of 12".

3. Waterstop shall be “Greenstreak” #703 3/16” x 6” or equal for the base/wall connection.
 4. A bentonite based hydrophilic swellstop shall be used on a wall to wall construction joints. It shall be RX-101 by Cetco or Conseal CS-231 or approved equal.
- F. Accessories: All accessories shall comply with “Recommended Standards for Water Works”, latest edition, by Great Lakes Upper Mississippi Board of State Public Health and Environmental Managers.
1. Access Hatch – All hatches shall be installed in the roof, shall be constructed from T-316 stainless steel, shall include provisions for a padlock and shall have weather stripping where the hatch cover meets the hatch. Roof hatches are sized as follows:
30’ diameter reservoir – 2’-6” x 4’-0”
 2. Air Vent – All vents shall be a minimum of 12”, screened with non-corrosive screen (24 mesh) and installed in the center of the roof. The vent shall be designed to prevent the entrance of surface and rain water, birds, animals, insects and dust as much as is feasible and still vent properly.
 3. Inflow Pipe – The inflow pipe and fittings shall be Class 52 Ductile Iron within 5-ft of the tank. Fittings under the tank and to a point 5 feet beyond shall be restrained joints by mechanical joint and Mega-Lug, or approved equal. Ductile iron pipe shall extend through the bottom of the tank to floor level and as shown on the Plans. Refer also to the Plans for requirements.
 4. Inflow Pipe, Interior, and Check Valve – The interior inflow pipe above the ductile iron pipe as required through the floor of the tank and as shown on the Plans shall be SCH 80 PVC. The end of the interior flow pipe shall be equipped with a Technocheck check valve and 90-degree elbow as shown on the Plans and recommended by the tank supplier. Provide all fittings, adapters, etc. as needed for transitions between different pipe and fittings materials. Stainless steel brackets fabricated and anchored as shown on the Plans and Details shall be provided.
 5. Overflow – The overflows shall be 8” as noted on the Plans, screened with non-corrodible screen and installed in the sidewall immediately under the roof. Overflow shall be provided with a pipe thread at the exterior wall surface and piped to ground level with Class 50 DI pipe and fittings, and then transitioning to Class 52 DI pipe and fittings to 5-ft minimum beyond the tank foundation as shown on the Plans. Stainless steel brackets fabricated and anchored as shown on the Plans and Details shall be provided at such intervals as will adequately stabilize the overflow pipe and prevent people from climbing them, approximately every 7’.
 6. Drain – The drain shall be 8” as noted on the Plans, Class 52 DI pipe and fittings to joining with the underground overflow pipe and 5-ft minimum beyond the tank foundation.
 7. Exterior Ladders – The ladders shall be hot dip galvanized after fabrication. A minor amount of welding may be necessary after galvanizing. Welds shall then be painted with a cold galvanizing compound. Exterior ladders shall extend only to within 10’ of the ground level and a lockable ladder gate/cover shall be provided at the end of the ladder. Exterior ladders shall be equipped with a “Lad-Saf” Flexible Cable Safety System (Galvanized) or equal per State of Washington General and Health Standards, WAC 296-24-881009, Special Requirements.

8. Interior Ladders – The ladders shall be stainless steel fabrication. Interior ladders shall extend the full height of the reservoir.
 9. Water Level Indicator – Half travel indicators shall consist of a nominal 1” x 6” white PVC indicator board with black numerals and gradation markings, rubber float, and 1/8” stainless steel cable and 2” stainless steel pipe enclosed guided system.
 10. Control Wire and Other Instrumentation Blockouts – Provide as shown and detailed in the Plans and Specifications. Otherwise, provide two 2” galvanized pipes cast into the roof adjacent to the access hatch for mounting the water system controls onto the reservoir.
 11. Safety Railing – Provide a full circumference safety railing, hot dip galvanized, as shown on the Plans.
 12. Radar Transmitter Nozzle – Provide 6” stainless steel pipe blockout/nozzle cast into the roof as shown on the Plans for mounting the radar transmitter.
 13. Intrusion Switches, Control and Electrical Wires – Coordinate all requirements with the Plans and Electrical and Controls plans and specifications. Intrusion switches shall be installed on the tank access hatch and exterior ladder gate.
 14. Sampling Station – Sampling station line side wall penetrations and other details as shown the Plans shall be coordinated with the tank installation.
- G. Cure Spray, Form Release Agents, Coatings, etc.: All cure sprays, form release agents and coatings used on surfaces that will come into contact with the water to be stored in the reservoir must have NSF approval for use with potable water or adequate cleaning procedures must be employed to ensure that all latent residue is remove prior to placing the reservoir in service.
- H. Piping – All pipes extending into the reservoir shall be installed prior to the start of reservoir construction and shall be stubbed up out of the ground so that the reservoir base slab can be poured around the pipes. Ductile Iron pipe and restrained (Megalug) mechanical joint fittings shall be used under the tank to 5-ft beyond the edge of the footing.

PART 3 - EXECUTION

3.01 DESIGN

- A. The reservoir shall be designed per the loads as shown in the Structural Notes on the Structural Drawings in the Plan.

3.02 CONSTRUCTION

- A. Placement of Reinforcing Steel – Bending and placing will be in accordance with “Specifications for Structural Concrete for Buildings” (ACI 318-latest edition). Laps and splices shall be staggered and all reinforcing steel shall be accurately placed as shown on the plans. All reinforcing steel shall be firmly secured to prevent movement during the placing of the concrete. The only exception to this shall be where dowel bars are used at the connection of the base and wall. These dowels may be installed after the concrete is placed (“wet set”) as long as the depth of embedment and the location are accurately controlled, and installation is done prior to the initial setting of the concrete.

- B. Concrete shall generally be placed within 90 minutes of batching. However, in extreme cases where this is not physically possible because of the distance between the job site and the ready-mix plant, an approved retarding agent may be used.
- C. Before each wall pour, the existing concrete shall be thoroughly cleaned by pressurized water or whatever means may be necessary to remove all loose scale, oil and any foreign material that may prevent a good bond with the existing concrete.
- D. In the pouring process, concrete shall not be allowed to free-fall more than 5 feet. The concrete shall be deposited in horizontal layers not to exceed 18" in depth and shall be placed as closely as possible to its final position to avoid segregation.
- E. Vibration – Vibrate all concrete with high frequency internal vibrators as it is places. Penetrate the concrete with a sufficient number of vibrations to thoroughly work the concrete around reinforcement and embedded fixtures without separation of aggregate.
- F. Base and Roof Slope – The base can be sloped to a specific drain pipe if it is located near the center of the reservoir, but unless specified to slope, the base will be flat. The roof shall slope from the center to the outside edge at a minimum of ¼" per foot of radius.
- G. Form Removal – Normal elapsed time on wall form removal shall be approximately 16 hours unless low temperatures or poor weather conditions dictate otherwise. The normal elapsed time for roof form removal shall be 7 to 10 days.
- H. Concrete Finishes:
 - 1. Base and Roof – All slab finishes shall be a "wood float" finish only, to prevent slippery surfaces. The concrete shall be worked no more than is necessary to produce a "wood float" finish that is uniform in texture and relatively free from screed/float marks. The underside of the roof shall be a rough form finish as results for the use plywood forms.
 - 2. Walls – Steel forms shall be used on all wall pours. Forms may be built with a minimum of refinement but as a minimum must not leak excessive amounts of mortar or yield beyond specific tolerances when the concrete is vibrated. Rock pockets, honeycombed areas, form tie holes and any holes over ½" deep will be repaired. However, no grinding/repairing will be done on "fins", projections and minor form misalignments (especially at construction joints) as long as they do not exceed the specified tolerances. No sacking or hand-rubbing will be performed on any concrete finishes.
 - 3. Tolerances – Allowable tolerances for concrete surfaces shall be classified as "abrupt" and "gradual". Offsets caused by displaced or misplaced forms and form alignment shall be considered as abrupt irregularities. All other are classed as gradual irregularities. Allowable tolerances are the same for both slabs and walls and are as follows:
 - 1. Abrupt – ½"
 - 2. Gradual – 1"

3.03 DISINFECTION

- A. Cleaning – Clean and pressure wash the interior of the reservoir after it is constructed.
- B. Disinfecting – Disinfect per Method 2 per AWWA C652-86. This method does not require

disposal or neutralization of large amounts heavily chlorinated water which can be hazardous to the environment.

- C. The Contractor shall provide chlorine solution materials and concentration information to the Engineer, along with a letter describing the procedures, methods, materials, timing, etc.
- D. The Contractor shall be responsible for all equipment necessary for cleaning and disinfecting the tank. The Contractor shall coordinate water usage for cleaning using metered water from the Owner. Filling tanks for disinfection shall be coordinated with the Owner. Filling will be spread across multiple days based on water demand and excess system water available for filling. Owner will not allow tanks to be filled simultaneously.
- E. The Contractor shall be responsible for de-chlorinating water prior to discharge to natural drainage courses or obtaining permission and coordinating with the Owner to deliver and discharge water to the sewer system if approved by the Owner.
- F. Upon completion of filling tank Owner shall take water sample for bacterial analysis, and upon receipt of negative bacteria results tank may be placed in service. Positive bacterial test results will require to disinfect again until negative results are obtained. Retesting will be at no cost to the Owner.

3.04 FIELD TESTING

- A. Hydrostatic Testing (Reservoir) – Testing of the reservoir consists of filling the reservoir to check for water tightness. This test shall be performed 28 days after concrete pouring is completed and no later than 60 days after completed. This need not be a separate “leak” test, but can be performed with the initial filling after the reservoir is disinfected. The testing of the water can be done from this initial filling and if there are no obvious problems with the reservoir, it can be put on line without emptying and refilling.

To test the reservoir, close outlet valves, fill to full, close inlet valves and let set for 24 hours. Note the height of the water. Check the water height after three consecutive 24 hour periods. Allowing for evaporation, the water level should not drop more than 1 tenth of one percent in any 24-hour period.

Prior to putting the tank online after successful testing, the Contractor shall test the chlorine residual at three representative locations in the tank. If directed by the District and Engineer, the Contractor shall add chlorine solution to increase the residual chlorine concentration so that when the water is added to the distribution system, the chlorine concentration is at least 0.3 ppm and less than 4.0 ppm. After chlorine addition, if required, the Contractor shall adequately mix the tank to achieve uniform chlorination in the tank.

- B. Any unusual leaks disclosed by this test shall be corrected by the Contractor, at no cost to the Owner, in accordance with the manufacturer's recommendations.
- C. Labor and equipment necessary for tank testing is to be included in the price of the tank.

3.05 RESERVOIR CHARACTERISTICS

- A. Aesthetics – The characteristics of the forming system and construction methods utilized result in a distinct construction joint at each 5’ wall section. Note the allowable tolerances in 8. Concrete finishes, b. and c. under METHODS OF CONSTRUCTION.
- B. Cracking – Surface cracks may appear in the exterior surface of walls on the magnitude of .002-.005 inch wide and are not considered structural defects. These cracks may occur due

to: Tension in the concrete at the outer wall surface, differing cure rate of the wall sections as the wall pouring progresses, restrained drying shrinkage, etc. Strict water/cement ratio control, liberal uses of cure sprays and paying close attention to timeliness of apply design loads to the structure keep this cracking to a minimum but cannot completely eliminate them.

As long as the reinforcing steel is protected and thus, the structural integrity of the reservoir maintained, there is no need to consider any repair or elimination of these cracks.

- C. Weeping and Efflorescence – Some “weeping” may occur in the first 3 to 4 weeks after the reservoir is initially filled until the concrete “seals” itself. Some minor dampness may appear at various times after this but is not considered a problem as long as it is not a measurable water loss and is not affecting the structural integrity of the reservoir. This weeping will occur at locations where there is a break in the surface of the concrete (cracks and construction joints) and efflorescence (white calcified deposits) will form at these locations. These deposits are a natural occurrence in any concrete structure. ACI 224.1 R-93 explains this a “A natural process of crack repair know as autogenous healing... It has practical application for closing dormant cracks in a moist environment such as may be found in mass concrete structures.”

*****END OF SECTION*****

SECTION 33 35 00 - GRAVITY SEWER PIPING

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Work includes but is not limited to following:
 - 1. Furnishing and installing gravity sewer piping systems including pipe, joints, fittings, and pipe supports, as shown on the Plans and specified in these Specifications, and as required for a complete and functional installation.
 - 2. Gravity sewer piping defined in this section includes sanitary sewer system, the storage tank overflow/drain system, and vault drain to daylight systems.

1.02 RELATED SECTIONS

- A. Coordinate related work specified in other parts of the Project Manual, including but not limited to following:
 - Section 31 10 00 Site Clearing
 - Section 31 20 00 Earth Moving
 - Section 31 23 33 Trench Excavation and Backfill
 - Section 31 32 11 Soil Surface Erosion Control
 - Section 33 05 00 Common Works Results for Utilities
 - Section 33 05 63 Precast Concrete Utility Structures
 - Section 33 16 33 Concrete Water Reservoirs
 - Section 33 41 00 Storm Utility Drainage Piping

1.03 REFERENCES

- A. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, most recent edition.
- B. WSDOT, Standard Plans for Road, Bridge and Municipal Construction, most recent edition.
- C. Washington State Department of Ecology Criteria for Sewage Works Design.
- D. Washington State Department of Ecology's Stormwater Management Manual for Western Washington, most recent edition.
- E. Lake Whatcom Water and Sewer District Design and Construction Standards, February 23, 2022 or latest edition.

1.04 SUBMITTALS

- A. Field Fabrication
 - 1. For pipelines which are assembled in the field from standard fittings, submit complete data on pipe and fittings, including any manufacturer's installation instructions.

- B. Material Certification
 - 1. Certification of all materials, and manufacturing properly executed by the manufacturer, shall be available to show compliance with the Specification of materials being furnished. Test data on factory tests performed shall be provided as requested by the Engineer.
- C. Existing Pipe / Structure Verification
 - 1. Expose all existing pipes or structures that are to be connected to new pipelines or new structures. Verify the size, material, elevation, horizontal location, and pipe service of these existing pipes or structures with sufficient lead-time to make accommodations as necessary.

1.05 QUALITY ASSURANCE

- A. Installer shall be a Specialist.
- B. Regulatory Requirements: See 1.03 References (this section) and Section 01 41 00 Regulatory Requirements.
- C. See Section 01 44 00 Quality Assurance Quality Control.

1.06 PROJECT SITE CONDITIONS

- A. Locate and provide protection of existing utilities affected by the work. Minimize disruptions to access and existing sewer service connections to existing facilities.
- B. Temporary bypass wastewater systems are not anticipated for this project.

PART 2. PRODUCTS

2.01 GENERAL

- A. Comply with “Quality Assurance” provisions, “References,” Specifications, and Manufacturer’s data. Where these may be in conflict, the more stringent requirements govern.

2.02 PIPING MATERIALS

- A. Buried Pipe
 - 1. Gravity Sewer Pipe (Sanitary and Overflow/Drain systems)
 - a. PVC for Gravity Sewer applications:
 - (i) ASTM D3034, SDR 35 for 4” through 15” pipe, per WSDOT 9-05.12(1). Or as noted on the plans.
 - (ii) Note: Overflow/Drain system piping shall include thrust blocking as identified on the Plans.
 - b. Ductile Iron pipe for daylighted section of Overflow/Drain pipe near air gap discharge structure:
 - (i) WSDOT 9-05.13 Ductile Iron Sewer Pipe. Ductile Iron cement lined 8 mil poly wrapped Class 50. Provide adapters as required for transition from PVC to DI material. Provide fittings as required for restrained discharge elbow.

- c. Ductile iron pipe for Overflow/Drain pipe at and below water tank:
 - (i) Refer to Section 33 16 33 Concrete Water Reservoirs and the Plans.
 - d. PVC drain piping (for vault drains):
 - (i) ASTM D3034, SDR 35 for 4" through 15" pipe, per WSDOT 9-05.12(1). Or as noted on the plans.
- B. Poured-in-place Slab, Floor, Wall, and Roof Penetrations
 - 1. All penetrations of new poured-in-place concrete slabs, floors, walls, and roofs shall be poured in place ductile iron wall pipe. It shall be the Contractor's responsibility to verify the size and location of all structure penetrations prior to pouring concrete. All sleeves shall be supported by formwork to prevent contact with the reinforcing steel.
 - 2. Coordinate with the requirements of the Concrete Water Storage Tank supplier and specifications Section 33 16 33 as required.
- C. Pipe Wall Penetration Seals (Through Pre-Cast or Existing Concrete Structures)
 - 1. Penetrations of end and intermediate diaphragm walls. Annular space shall be fitted with flexible seal adapter with neoprene boot a minimum of 3/8" thick per ASTM C-443, and shall be held in place with an internal expanding stainless steel band such as "Kor-N-Seal" or approved equal.
 - 2. Also see Plan Details and District standards.
- D. Flexible Couplings and Flanged Coupling Adapters
 - 1. Flexible couplings for use with PVC piping shall be Romac Style 511, or approved equal.
 - 2. Couplings for use with ductile iron pipe shall have the following:
 - a. Sleeve: Cast iron or fabricated steel.
 - b. Followers: Cast iron, ductile iron, or steel.
 - c. Sleeve Bolts: ASTM A325, Type 3; malleable iron; or equivalent, except for buried and submerged, which shall be Type 304 SS and Type 316 SS, respectively.
 - d. Coating: Fusion epoxy line and coat sleeve and followers.
 - e. Pressure Rating: 1-1/2 times the test pressure of the applicable service.
 - f. Flanged Coupling Adaptor Flanges: Match mating flanges. If required by connecting valve or other device, provide flanges with inside diameter equal to nominal pipe diameter.
 - g. Flexible Couplings- Manufacturers:
 - (i) Connecting Pipe with Identical Outside Diameters: Smith-Blair 411 or 441; Dresser Style 38 or 53; or equal.
 - (ii) Connecting Pipe with Slightly Different Outside Diameters: Smith-Blair 413 or R441; Dresser Style 162; or equal.
 - h. Flange Coupling Adaptors - Manufacturers:
 - (i) Smith-Blair 912 or 913; Dresser Style 127 or 128; or equal.

- i. Gaskets: Oil and grease resistant; Smith-Blair Grade 60; Dresser Grade 42; or equal.
 - j. Joint Restraint: Provide joint harnesses (tie rod lug or attachment plate assemblies) designed for the test pressure or 50 psi, whichever is greater, across flexible couplings and flange coupling adaptors. For steel pipe the joint harness shall conform to the requirements of Chapter 13 of AWWA M-11, paragraph 13.10, Table 13-6 - Tie Bolt Schedule for Harnessed Joints. Anchor studs may be used on flange coupling adapters for pipe up to 12 inches in diameter.
 - k. Protection for Buried Couplings and Adaptors:
 - (i) Double wrap with polyethylene encasement, AWWA C105 and tape the edges of the encasement with PVC tape.
- E. Bolts and Nuts
 - 1. Bolts, nuts and washers for buried or exposed conditions shall conform to WSDOT Section 9-30.2.
 - 2. Bolts and nuts that will be submerged or periodically-submerged shall be stainless steel, Type 316, ASTM F594 or ASTM F 836.

2.03 VALVES

- A. Refer to Section 33 10 00 Potable Water Systems.

2.04 CLEAN OUTS

- A. Clean outs shall comply with the Plan Details.

2.05 MARKING TAPE

- A. Detectable marking tape shall comply with WSDOT Standard Specification 9-15.18.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 PIPING INSTALLATION

- A. Joining Dissimilar Materials
 - 1. Contractor shall be responsible for identifying and submitting for approval, the appropriate methods and fittings for joining the dissimilar pipe materials that he elects to use on the project from the allowed pipe types specified. All such connections between dissimilar materials shall be in accordance with each pipe manufacturer's recommendations. WSDOT Section 7-08.3(2)G. NO LEAKAGE IS ALLOWED, IN OR OUT.
- B. Handling, Storage, Cutting of Pipe
 - 1. Protect lining when handling ductile iron pipe. Cut pipe with milling type cutter, rolling pipe cutter, or abrasive saw cutter. Do not flame cut. Cuts shall leave a

smooth end at right angles to the pipe axis. Dress cut ends of pipe in accordance with the type of joint to be made.

2. Dress cut ends of pipe for flexible couplings and flanged coupling adapters as recommended by the coupling or adapter manufacturer.

C. Joining Flanged Pipe

1. Prior to connecting flanged pipe, the faces of the flanges shall be thoroughly cleaned of all oil, grease, and foreign material. The gaskets shall be checked for proper fit and thoroughly cleaned. Care shall be taken to assure proper seating of the flange gasket. Bolts shall be tightened so that the pressure on the gasket is uniform. Torque-limiting wrenches shall be used to ensure uniform bearing insofar as possible. If joints leak when the hydrostatic test is applied, the gaskets shall be removed and reset and bolts retightened until there is no leakage.

D. Pipe Bedding - General

1. All pipe shall be well bedded throughout its length true to line and grade and not supported by the joints. Bell holes shall be dug as required to ensure uniform support along the pipe barrel. All boulders, cobbles, and organic roots and debris shall be removed to prevent point loadings and to provide a minimum of 6 inches specified bedding material under and around all portions of the pipe. Pipe shall be bedded in accordance with WSDOT Section 7-09.3(9).

E. Gravity Sewer Piping Installation

1. All pipe shall be installed in conformance with the manufacturer's recommended procedures, for the particular pipe being installed. Construct sewer to lines and grades shown on the Drawings if no obstacles are discovered in the field. Advise Engineer immediately if obstructions are encountered that would impact gravity sewer grade.
2. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with an approved temporary plug. All pipe laid in the trench to the specified line and grade shall be kept under longitudinal compression until the backfill has been compacted to the crown of the pipe.

F. Testing

1. General Requirements:
 - a. All tests shall be conducted in the presence of the Engineer or his designee (NO EXCEPTIONS).
 - b. All testing shall be in conformance with District Standards S1 and S2.
 - c. All leaks shall be repaired and remedied, with tests and repairs repeated until the system meets testing requirements to the satisfaction of the Engineer.
2. Low Pressure Air Test:
 - a. Pressure testing for gravity sewer piping shall conform to WSDOT Section 7-17.3(2)F Low Pressure Air Test for Sanitary Sewers Constructed of Non-Air-Permeable Materials.
3. Mandrel Testing:

- a. PVC gravity sewer segments shall be mandrel tested in conformance with WSDOT 7-17.3(2)G Deflection Test for Thermoplastic Pipe.
- 4. Removing Debris from New Sewers: Upon completion of each portion of the system and prior to connecting to any facility impacted by solids, the system shall be thoroughly flushed to remove and catch all foreign matter such as rocks, misplaced tools and debris.
- G. Adjusting and Cleaning
 - 1. Make any adjustments as required. Leave installations clean; premises free from residue of work of this section.

3.03 VALVE INSTALLATION

- A. Refer to Section 33 10 00 Potable Water Systems.

*****END OF SECTION*****

SECTION 33 41 00 - STORM UTILITY DRAINAGE PIPING

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Work includes but is not limited to following:
 - 1. Installation of storm sewer pipes, catch basins, and related facilities as shown on the Plans.

1.02 RELATED SECTIONS

- A. Coordinate related work specified in other parts of the Contract Documents, including but not limited to following:
 - Section 31 10 00 Site Clearing
 - Section 31 20 00 Earth Moving
 - Section 31 23 33 Trenching and Backfilling
 - Section 31 32 11 Soil Surface Erosion Control
 - Section 33 05 00 Common Works Results for Utilities
 - Section 33 05 63 Precast Concrete Utility Structures

1.03 REFERENCES

- A. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, most recent edition.
- B. WSDOT Standard Plans for Road, Bridge and Municipal Construction, most recent edition.
- C. Washington State Department of Ecology's Stormwater Management Manual for Western Washington, most recent edition.
- D. Lake Whatcom Water and Sewer District Design and Construction Standards, February 23, 2022 or latest edition.

1.04 SUBMITTALS

- A. Contractor must have approval from the Engineer of Record (Engineer) prior to incorporating materials into project. Group submittals that are part of the same assembly. The submittal must clearly indicate where the product is intended to be used and shall include spec reference and/or plan sheet reference. Any approvals granted for use of materials will be limited to those uses identified on the submittals. Any materials incorporated into the project without an approved submittal may be removed at the request of the Engineer at the contractor's expense.
- B. Submittals are required for the following:
 - 1. Type 1 & 2 catch basins, castings, grout, grates, and all appurtenances.
 - 2. Geotextile fabric.
 - 3. Storm sewer pipe, footing drain pipe, perforated pipe, fittings, and all appurtenances.
 - 4. Dispersion trench grade boards, support posts, and washed rock

1.05 QUALITY ASSURANCE

- A. Manufacturer/Installer shall be a Specialist.
- B. Regulatory Requirements - See Section 01 41 00, Section 01 44 00, and the Standard Specifications.

PART 2. PRODUCTS

2.01 GENERAL

- A. Comply with “Quality Assurance” provisions, “References,” and Specifications. Where these may be in conflict, the more stringent requirements govern.

2.02 MATERIALS

- A. Storm Sewer Pipe.
 - 1. Pipe used for storm sewers shall be PVC meeting the requirements of WSDOT Standard Specification 9-05.12(1)
- B. Storm Drain Cleanouts.
 - 1. Cleanout bends and piping from host pipe to surface shall be SCH 40 PVC per WSDOT Standard Specification 9-05.12(1).
- C. Solid Pipe for Connecting Footing Drains shall be PVC per WSDOT 9-05.12.
- D. Perforated pipe for Dispersion Trenches shall be SCH 40 Perforated PVC per WSDOT 9-05.2(6).
- E. Backfill for Dispersion Trenches shall be per WSDOT 9-03.12(4) Gravel Backfill for Drains.
- F. Footing Drains. Pipe shall comply with WSDOT Standard Specification 9-05.2(7) – Perforated Corrugated Polyethylene Drainage Tubing Underdrain Pipe or Perforated PVC Underdrain pipe per WSDOT 9-05.2(6).
- G. Bedding for Footing Drains. Bedding for footing drains shall comply with WSDOT 9-03.12(4) – Gravel Backfill for Drains.
- H. Geotextile Fabric for Footing Drains. Fabric shall comply with WSDOT Standard Specifications 9-33.2, Table 1, Moderate Survivability, Nonwoven.
- I. Geotextile Fabric for Dispersion Trenches shall comply with WSDOT 9-33.2(1) Table 3, Separation, Nonwoven.
- J. Catch Basins.
 - 1. Type 1 Catch Basins shall comply with WSDOT Standard Specification 9-05.50(3) - Precast Concrete Catch Basins, and WSDOT Standard Plan B-5.20-03.
 - 2. Type 2 Catch Basins shall comply with WSDOT Standard Specification 9-05.50(2) – Manholes, and WSDOT Standard Plan B-10.20-02.
 - 3. Adjusting sections shall be precast concrete intended for the application. Brick may be used as the final adjusting course beneath the casting frame. In no case shall wood, rocks or other scrap material be used to adjust castings.

- 4. Metal frame, covers, and inlet grates located in traffic and landscape areas shall comply with WSDOT Standard Specification 9-05.15 - Metal Castings, and WSDOT Standard Plans.
- K. Marking Tape. Detectable marking tape shall comply with Standard Specification 9-15.18. Tape widths to be per manufacture's recommendations based on pipe sizes.
- L. Bedding & Backfill. Bedding and backfill materials shall be per Section 31 23 33 – Trenching and Backfilling.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 INSTALLATION

- A. Install in accordance with "Quality Assurance" provisions, "References," Specifications, and Manufacturer's directions. Where these may be in conflict, the more stringent requirements govern.
- B. Line and Grade.
 - 1. Survey line and grade shall be established prior to laying pipe per Standard Specification 7-08.3(2)A. Contractor to provide construction layout staking.
 - 2. In areas between survey stakes, transfer line and grade from the Plans to the storm line trench and maintain said line and grade using construction practices in conformance with established industry standards.
- C. Handling, Storage and Cutting of Pipe.
 - 1. Material shall be stored in such a manner to prevent the pipe from bowing or otherwise being damaged.
 - 2. Saw cut pipe to leave a smooth end at right angles to the pipe axis. Prior to joining pipe, cut ends shall be de-burred, beveled and in accordance with the type of joint to be made.
- D. Pipe Installation
 - 1. Storm sewer pipe shall be constructed in accordance with WSDOT Standard Specification 7-08 - General Pipe Installation Requirements.
 - 2. Pipe shall be installed on a well bedded, prepared foundation throughout its length per Section 31 23 33 Trenching and Backfilling. Grade the bottom of the trench by hand, if necessary, to the line and grade to which the pipe is to be laid, with proper allowance for pipe thickness and for bedding material.
 - 3. The pipe shall be uniformly bedded under and around the entire length of the barrel. The bedding shall be dug out to accommodate pipe bells and prevent the joints from supporting excess weight.
 - 4. Take precautions to prevent water from entering the trench during excavation. Do not lay pipe when, in the opinion of the Owner, trench conditions are unsuitable.

5. Prevent excavated or other foreign material from entering the pipe during the laying operation. When laying operations are not in progress, at the close of the day's work, or when labor is absent from the job, close and block all open pipe ends to prevent entry of foreign material or creep of the joints.
6. Take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.

E. Catch Basins.

1. All catch basins shall be installed per WSDOT Standard Specification 7-05.3 including excavation, foundation preparation, installation, plumbing and finishing.
2. Pipes entering catch basins shall be trimmed flush with the grouted fillet between the pipe and catch basin structure. Any damage to grouting during trimming operations shall be corrected to the satisfaction of the Owner.
3. The iron frame and grate shall be set to the plan elevation by means of precast concrete grade rings, adjusting rings, or concrete bricks. Scrap lumber, rocks or other material shall not be used in setting the rim elevations. The bearing surface of the all grade rings, bricks, and casting frame shall rest on a full mortar bed to provide a water tight seal between the precast structure and the casting.
4. Prior to final acceptance, remove all debris from catch basins.

F. Footing Drains

1. Provide wall foundation with a perimeter footing drain system to collect seepage water, as shown on the Plans. Construct footing drain trenches for each specific application as shown on the Plans, or if not specifically identified, line with filter fabric, bed perforated pipe in 12" minimum surrounding thickness of drain rock specified above. Establish elevations and grades of footing drains so as to permit gravity drainage to the discharge locations or systems as shown on the Plans.
2. Where necessary to extend a line from the footing or under-slab drain to the on-site storm drain system, use minimum 4" non-perforated tight lines. Confirm that no utility conflicts are created by construction of additional drainage tight lines not shown on the Plan. Provide owner with as-built information as to the location of the final footing and under-slab drain system and associated tight lines.

G. Surface Drainage.

1. During construction, grade, drain, and maintain work site so as to prevent unnecessary construction delays due to ponding. Protect existing drainage structures and adjacent properties from sedimentation, sediment runoff, and damaging drainage velocities.
2. Provide proper coordination of site grading, landscaping, access road, and culverts to ensure positive drainage of entire site with no ponding, and all surface stormwater is directed away from access roads, parking areas, or structures where surface ponding is undesirable.

3.03 ADJUSTING, CLEANING, AND REPLACEMENT

- A. Make any adjustments as required.
- B. Clean: Leave installations clean; premises free from residue of work of this section.

*****END OF SECTION*****

PART 4
MISCELLANEOUS DOCUMENTS

PART 4 – MISCELLANEOUS DOCUMENTS

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APPENDIX A
WASHINGTON STATE PREVAILING WAGE RATES

Appendix: Washington State Prevailing Wage Rates

The State of Washington prevailing wage rates applicable for this public works project, which is located in Whatcom County, may be found at the following website address of the Department of Labor and Industries:

<https://lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-rates/>

Based on the bid submittal deadline for this project, the applicable effective date for prevailing wages for this project is February 27, 2024. A copy of the applicable prevailing wage rates are also available for viewing at the office of the Owner, located at:

Lake Whatcom Water and Sewer District, 1220 Lakeway Dr, Bellingham, WA 98229

Upon request, the Owner will mail a hard copy of the applicable prevailing wages for this project.

APPENDIX B
FEDERAL DAVIS-BACON PREVAILING WAGE RATES

Appendix: Federal Davis-Bacon Prevailing Wage Rates

The Federal Davis-Bacon prevailing wage rates applicable for this public works project, which is located in Whatcom County, may be found at the following website address of The Official U.S. Government System (SAM.gov):

https://sam.gov/search/?index=dba&sort=-modifiedDate&page=1&pageSize=25&sfm%5BsimpleSearch%5D%5BkeywordRadio%5D=ALL&sfm%5BsimpleSearch%5D%5BkeywordEditorTextarea%5D=&sfm%5Bstatus%5D%5Bis_active%5D=true&sfm%5BwdLocationWrapper%5D%5BwdStates%5D%5B0%5D%5Bkey%5D=WA&sfm%5BwdLocationWrapper%5D%5BwdStates%5D%5B0%5D%5Bvalue%5D=Washington&sfm%5BwdLocationWrapper%5D%5BwdCounty%5D%5B0%5D%5Bkey%5D=16964&sfm%5BwdLocationWrapper%5D%5BwdCounty%5D%5B0%5D%5Bvalue%5D=Whatcom&sfm%5Bconstruction_type%5D%5B0%5D%5Bkey%5D=Heavy&sfm%5Bconstruction_type%5D%5B0%5D%5Bvalue%5D=Heavy

Based on the bid submittal deadline for this project, the applicable effective date for prevailing wages for this project is February 27, 2024. A copy of the applicable prevailing wage rates are also available for viewing at the office of the Owner, located at:

Lake Whatcom Water and Sewer District, 1220 Lakeway Dr, Bellingham, WA 98229

Upon request, the Owner will mail a hard copy of the applicable prevailing wages for this project.

APPENDIX C

PROJECT PERMITS

Whatcom County Building Permit
Whatcom County Demolition Permit (Draft)



Curt Schoenfelder <cschoenfelder@wilsonengineering.com>

Ready to Issue - Whatcom County Permit: COM2023-00072 - LWWSD Water Reservoirs

Nick Smith <NSmith@co.whatcom.wa.us>

Fri, Dec 8, 2023 at 4:28 PM

To: "Curt Schoenfelder (cschoenfelder@wilsonengineering.com)" <cschoenfelder@wilsonengineering.com>, "justin.clary" <justin.clary@lwwsd.org>

Hello,

The Whatcom County building permit #: COM2023-00072 to construct two water reservoirs at [1740 Lake Whatcom Blvd](#) is approved and is ready to be issued subject to you submitting the following information:

1. Please provide a licensed contractor of record for the project.

The permit fees are noted in the attached and payment of your permit can be achieved by the following options:

1. Credit Card or Debit Card. Please contact Whatcom County PDS at 360-778-5930. Be sure to leave your name, phone number, permit/application or invoice number and site address on your message. If you pay by a credit card you will incur a 2.35% processing fee. An additional \$1.00 processing fee is charged if you pay by debit card.
2. Mail or drop off a check. You may mail in a prewritten check for the amount listed above. Prewritten checks must be made out to Whatcom County Planning and Development Services (PDS) and can be mailed to [5280 Northwest Drive, Bellingham, WA 98226](#). Please include your permit number in the memo line of your prewritten check. If you wish to pay in person, our office is open Monday thru Friday from 9am to 4pm.

Please note, the building permit will be eligible for issuance on **June 1, 2024** (due to the seasonal watershed closure).

Feel free to let us know if you have any questions.

Regards,

Nick Smith

Permit Center Specialist



Whatcom County Planning & Development Services

[5280 Northwest Drive](#)

[Bellingham, WA 98226](#)

P. 360-778-5913

www.whatcomcounty.us/pds

Disclaimer: The information contained in all correspondence with a government entity may be disclosable to third party requesters under the Public Records Act (RCW 42.56)

2 attachments



image001.png
23K



Invoice (INV-00011772).pdf
64K



Whatcom County
Planning and Development Services
5280 Northwest Drive
Bellingham, WA 98226
Phone 360-778-5900
Inspection 360-778-5902
epermits@co.whatcom.wa.us

Permit

NOT ISSUED

Permit Status: **NOAR**

Permit Number: **COM2023-00072**

Permit Type: **Building (Commercial)**

Commercial Permit

Work Classification: **Addition**

Issue Date:

Location Address

1740 LAKE WHATCOM BLVD, Bellingham, WA 98229

Parcel Number

3704084903720000

Contacts

The Firs Bible & Missionary Conference
4605 CABLE ST 4605 CABLE ST, BELLINGHAM, WA 98229-2699
(360)733-6840
lem@thefirs.org

Owner

LAKE WHATCOM WATER & SEWER
DISTRICT
1220 LAKEWAY DR, Bellingham, WA 98229
(360)724-9224

Applicant

justin.clary@lwwsd.org

Construction Permit Details

Proposed Work: Two new 32' diam .x 46' ht. (exterior dims) concrete water reservoirs each- 238K gallons- 1608 total sf along with 95 lf of 4' retaining wall, with associated piping, drainage and driveway improvements. Existing steel tank to be demolished.

Bldg. SQ. FT.

New Sq. Footage	1988	Original SF	0
Total Sq. Footage	1988		

Building Info

Basement	No	Census Code	C-119 New Other Type Structures
Foundation	Other	Number of Units	1
Occupancy Group:	U	Type of Construction:	VB
Type of Work:	NEW		

Set Back

Setback Front Ft.	P/L Lake Whatcom Blvd.	Setback Rear Ft.	P/L
Setback Side1 Ft.	P/L	Setback Side2 Ft.	P/L

Site or Approval Info

Commercial Project Type	Private Business	New Well Constructed after 1/19/2018	No
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POST THIS PERMIT ONSITE WITH THE APPROVED PLANS
COMPLIANCE WITH ALL INSPECTIONS AND CONDITIONS REQUIRED PRIOR TO OCCUPANCY

ALL INSPECTIONS SHOULD BE SCHEDULED A MINIMUM OF 1 BUSINESS DAY IN ADVANCE
INSPECTION LINE 360-778-5902 or online at <https://www.whatcomcounty.us/582/Scheduling>



Whatcom County
Planning and Development Services
5280 Northwest Drive
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Permit

NOT ISSUED

Permit Number: **COM2023-00072**
Permit Type: **Building (Commercial)**
Commercial Permit
Work Classification: **Addition**
Issue Date:
Permit Status: **NOAR**

Inspections

Inspection Type	Inspection Card (call inspections in the order they appear below)
Standard Inspections	Contractors, please call or schedule your inspection in this order
Pre-Construction (Com)	
Setback & Yard	
Footings	
Stemwall	
Slab Floor	
Final Health - OSS	
Final Health - Water	
Final Development (PW)	
Final Flood	
Final Planning/Zoning	
Final Natural Resources	
Fire Final Inspection	
Final Building	

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Permit

NOT ISSUED

Permit Number: **COM2023-00072**

Permit Type: **Building (Commercial)**

Commercial Permit

Work Classification: **Addition**

Issue Date:

Permit Status: **NOAR**

Condition Name

- 1 PW-Dev Custom** 1. All development shall comply with the Whatcom County Development Standards (WCDS). (www.whatcomcounty.us/498/Development-Standards).
- 2 BS - IRC/IBC WORK SITE POSTING** The established address for the proposed work site shall be posted on a substantial, weather-resistant sign in a location readily visible from the public way. In all cases, when applicable, the sign shall also include the corresponding division and/or lot number. NO EXCEPTIONS. Sign lettering must have sufficient contrast from the sign background. Lettering must be clear, readable and large enough to be discernible from a passing vehicle. Signs are required to be posted prior to any inspection requests and shall remain visible for the duration of the project construction.
- 3 PW-Dev Custom** 2. Contractor to follow approved SWPPP accordingly and monitor construction stormwater runoff. Contractor must ensure that the approved SWPPP is on-site at all times throughout the construction process.
- 4 BS - IRC/IBC APPV TO CONSTRUCT** IRC/IBC - Approved to construct, subject to field inspections, special inspections, corrections and provisions of plan review.
- 5 PW-Dev Custom** 7. The applicant had proposed to use full dispersion (BMP T5.30) for the on-site stormwater management. As shown in the accepted stormwater design, the required flow path for each impervious surface is to be maintained and remain undeveloped.
- 6 BS - IRC/IBC ANY DEVIATION** IBC/IRC - Any deviation in construction from approved plans requires prior review and approval by Whatcom County Planning and Development Building Services and Land Use Departments.
- 7 LU Excavation Waste** Any excess excavation waste or waste volume of any origin exported off site must be exported to a site with an ACTIVE LAND FILL AND GRADE PERMIT for the approved fill volume or a site with a current Washington State approved Reclamation Plan. Whatcom County Planning and Development Services will require documentation regarding the site location and current approval status.
- 8 RS - Seasonal Exposed Soil** Exposed soils exceeding 500 square feet shall not be permitted from October 1st through May 31st.
- 9 LU Conformance with site plan** All activity on site shall be done in accordance with the site plan approved by the Whatcom County Planning and Development Natural Resources Division. Any alterations from the approved site plan will require further review by Planning and Development Services.
- 10 LU Mulching** During the off-season (October 1 to May 31) all exposed soils shall be mulched per Whatcom County Standards and maintained through the off-season or until seeding or other stabilization methods are effective. In Water Resource Special Management Areas exposed soils shall be mulched through out the year.
- 11 PW-Dev Custom** 6. Construction vehicle access will be, whenever feasible, limited to one route. Access surfaces shall be stabilized to minimize the tracking of sediment onto adjacent roads.
- 12 Geologic Hazards** All recommendations prepared by GeoEngineers in their Geotechnical Engineering Services report, dated June 30, 2022, shall be followed in their entirety.
- 13 Separate Demolition Permit Condition** A separate demolition permit is required for the removal of the existing water tank.
- 14 Geologic Hazards** All foundation elements shall extend to unweathered bedrock, or structural fill extending to unweathered bedrock, as recommended by GeoEngineers.
- 15 PW-Dev Custom** 4. All work performed shall conform to the final approved Engineered Stormwater Design Report and shall be maintained per the approved Construction Stormwater Pollution Prevention Plan (CSWPPP), Temporary Erosion and Sediment Control (TESC) Plan, Operations and Maintenance manual (O&M) as applicable for the life of the project. Any revisions to the approved plans shall be submitted and administered as per WCDS Ch. 5 Sec 511-A.5 & WCDS Ch. 2 Sec 205-B.4
- 16 Noise Condition** Pursuant to WCC 20.80.620, no development shall exceed the maximum environmental noise level established by WAC 173-60.
- 17 BS - IRC/IBC SURVEY CONDITION** At the Public Service Inspector's request the owner/applicant shall provide an accurate boundary line survey of the proposed site, at the owner/applicant's expense, and as authorized by IRC Section R106.2 and IBC Section 107.2.5. The survey shall be prepared by a Washington State licensed surveyor.
- 18 BS - IRC/IBC SPECIAL INSP REPORT** Special inspectors shall furnish inspection reports to the Building Official and registered design professional in charge, indicating that work inspected was done in conformance to approved documents. Any discrepancies shall be reported for correction. A final report shall be submitted in a timely manner documenting corrections of any discrepancies, per IBC Section 1704.
- 19 LU Erosion Control** Proper Erosion Control measures shall be installed prior to any land alteration and maintained throughout the entire land disturbance / construction process. Any evidence of sedimentation shall be controlled and kept on site.
- 20 LU Reseeding** Reseeding of the area affected by the work detailed in this permit is required. Erosion and sediment shall be controlled and contained within the work area through best management practices until stabilization through revegetation can occur. Within regulated Critical Areas the seed source shall be native to the Pacific Northwest.

POST THIS PERMIT ONSITE WITH THE APPROVED PLANS
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Permit

NOT ISSUED

Permit Status: **NOAR**

Permit Number: **COM2023-00072**

Permit Type: **Building (Commercial)**

Commercial Permit

Work Classification: **Addition**

Issue Date:

- 21 BS - IRC/IBC SPECIAL INSPECTIONS** The owner or owner's agent shall employ one or more qualified special inspectors to provide special inspections during construction on the types of work listed under IBC Section 1704, in addition to inspections specified in IBC Section 110. The registered design professional in charge shall provide a statement which includes a list of materials and work requiring special inspections, a list of inspections to be performed and a list of the individuals, approved agencies or firms conducting such inspections, per IBC Sections 107 & 1704.
- 22 Geotechnical Inspection Requirements** A qualified professional shall observe the exposed foundation subgrade and certify that appropriate bearing conditions are present prior to constructing concrete forms.
- 23 LU Clearing Limits** Project clearing limits shall be marked at the edge of the regulated critical area buffer to ensure that no impacts occur within regulated areas.
- 24 LU Notify of add fill/grade** Notify Whatcom County Planning and Development Services, Natural Resources Division - Inspector at (360) 778-5900 of any additional Fill and / or Grading to be included.
- 25 LU Other Agency Condition** Obtaining a County permit does not supersede other local, state or federal statutes and regulations that may apply to this permit.
- 26 PW-Dev Custom** 5. The designated Construction Engineer shall be responsible for duties specified per WCDS Ch. 2 Sec 205 B regarding inspection, testing, construction surveys, compliance assurance documentation, certified cost estimate and certified record drawings.
- 27 RS - ESC Installed** Erosion and Sediment Control is required to be installed at the time of or immediately after clearing activity occurs and maintained for the duration of the project. Periodic inspections will occur. For structures, initial ESC inspection shall occur prior to footings inspection. Footings inspection will be denied until ESC is signed off on Inspection Record.
- 28 BS - IRC/IBC PLANS & INSP RECORD** Approved plans shall be kept on the building or work site at all times during which the work authorized thereby is in progress. Work requiring a permit shall not be commenced until the Inspection Record Card is posted or otherwise made available in a convenient location. (IRC Sections R105.7 & R106.3.1 / IBC Sections 105.7 & 107.3.1)
- 29 LU Natural Drainage Patterns** Natural drainage patterns shall be maintained and discharges from the site shall occur at the natural location, unless it can be shown that relocation will have no significant adverse impact to either built or natural systems as a result of the relocation.
- 30 PW-Dev Custom** 3. Certified Record Drawings (as-builts) for the installation of any new drainage system/facility, as well as the designation of any flow paths for stormwater purposes, shall be provided and approved by PW staff upon construction completion and prior to any Certificate of Occupancy. Minimum requirements for record drawing content and preparation can be found in Whatcom County Development Standards (WCDS) Ch. 5 sec 507-D.

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WHATCOM COUNTY

Planning & Development Services
5280 Northwest Drive
Bellingham, WA 98226-9097
360-778-5900, TTY 800-833-6384
360-778-5901 Fax

**Mark Personius, AICP**

Director

DRAFT

Demolition Permit Application And Submittal Requirements

- ☐ Notification of Approval from Northwest Clean Air Agency
 - NWCAA can be contacted at 360-428-1617
- ☐ Completed Demolition Permit Application
- ☐ Site Plan
- ☐ Contact the Utilities Underground Location Center (1-800-424-5555) at least two (2) business days before excavation
- ☐ Contact private utility companies if their services are to be interrupted or disconnected
- ☐ Contact Whatcom County Health Department (360-778-6000) if the demolition site is served by a septic system (*Sewer connections must be capped*)
- ☐ Submit the Notification of Demolition to the Northwest Clean Air Agency (Phone #811) for any demolition of buildings 200 square feet or greater
- ☐ The site must be cleared of all demolition debris and sent to an approved disposal location before a final inspection is conducted
 - Approved Disposal Locations:
 - Cando Recycling and Disposal
2005 Johnson Road, Point Roberts
360-945-2636
 - Republic Services of WA (Re-Comp of WA)
1524 Slater Road, Ferndale
360-384-1057
 - Recycling & Disposal Services (RDS)
4916 La Bounty Road, Ferndale
360-384-8011

Information on [Solid Waste and Environmental Outreach](#) available through Public Works

Submit all requested materials at once via email to epermits@co.whatcom.wa.us.

If you have any questions regarding these requirements, please contact our office at (360)778-5900 or pds@whatcomcounty.us

Fees will be assessed in accordance with the Whatcom County Unified Fee Schedule (UFS) in effect at the time of application submittal. Please contact Planning and Development Services to determine project specific fees. Click [here](#) to see the current UFS.

WHATCOM COUNTY
Planning & Development Services
5280 Northwest Drive
Bellingham, WA 98226-9097
360-778-5900, TTY 800-833-6384
360-778-5901 Fax



Mark Personius, AICP
Director

DRAFT

Demolition Permit Application

Before beginning any renovation or demolition project, property owners must document in good faith that no asbestos-containing materials will be disturbed. Northwest Clean Air Agency must be notified @ 360-428-1617 OR 1-800-622-4627 prior to any demolition that is greater than 200 square feet.

Permit # _____

Agent/Contact Name: _____

Mailing Address: _____ City _____

State _____ Zip Code _____ Phone # () _____

Email _____

Property Owner Name _____

Mailing Address: _____ City _____

State _____ Zip Code _____ Phone # () _____

Email _____

Contractor Name _____

Business Name: _____ License#: _____

Mailing Address: _____ City _____

State _____ Zip Code _____ Phone # () _____

Email _____

Site Information

Assessor's Parcel # _____ Div# _____ Block# _____ Lot# _____

Subdivision Name: _____

Site address _____

Number of Buildings currently on site: _____

Valuation (cost of completed project less value of land) \$ _____

Project Description (example: Demo of a 2,500 square foot SFR)

Site Information Continued

DRAFT

Is the demolition within a flood zone: ☐ Yes ☐ No

Whatcom County Code 17.16.120(b) Construction or reconstruction of residential structures is prohibited within designated floodways, except for (i) repairs, reconstruction, or improvements to a structure which do not increase the ground floor area; and (ii) repairs, reconstruction or improvements to a structure, the cost of which does not exceed 50% of the market value of the structure either (a) before the repair, reconstruction, or improvement is started; or (b) if the structure has been damaged, and is being restored, before the damage occurred. Work done on structures to comply with existing health, sanitary, or other safety codes, or to structures identified as historic places, shall not be included in the 50%.

Type of Structure:

- ☐ Single Family Residence ☐ Detached Structure
☐ Commercial Structure ☐ Agricultural Structure

No. of Buildings on Site: _____ Valuation: _____

Utilities to be Removed (Check all that apply):

- ☐ Sewer ☐ Septic ☐ Water ☐ Other: **electrical**
***tank drains to sewer**

If removing existing water service, will the service be re-used or abandoned?

- ☐ Re-Used ☐ Abandoned **portion of water main being abandoned in place**

Is there an above-ground or below-ground storage tank removal/decommission associated with this development activity?

- ☐ Yes ☐ No

Was SEPA required for the original construction of the development?

- ☐ Yes ** If yes, SEPA will be required for this proposed action **
☐ No **unknown, built in 1970s. SEPA has been completed for this project.**

Is there an addition or remodel that will follow this demolition permit?

- ☒ Yes ☐ No

Debris will be disposed at:

- ☐ Cando Recycling and Disposal ☐ Recycling & Disposal Services (RDS)
☐ Republic Services of Washington ☐ Other:

Any proposed fill, excavation or clearing must be noted below

Note: Automatic calculations are not available

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FILL The deposit of earth material by artificial means.						
BY FEET	Length (ft)	Width (ft)	Depth (ft)	Volume (ft ³)	Divided By 27	= Cubic Yard
Septic	X	X	=		/ 27 =	CY
Driveway/Road/Parking	X	X	=		/ 27 =	CY
Building site	X	X	=		/ 27 =	CY
Other	X	X	=		/ 27 =	CY
MATERIAL SOURCE:					TOTAL VOLUME:	CY

EXCAVATION The mechanical removal of earth materials. Grading is an excavation or filling or combination thereof. Earth material is any rock, natural soil, fill, or any combination thereof.						
BY FEET	Length (ft)	Width (ft)	Depth (ft)	Volume (ft ³)	Divided By 27	= Cubic Yard
Septic	X	X	=		/ 27 =	CY
Driveway/Road/Parking	X	X	=		/ 27 =	CY
Building site	X	X	=		/ 27 =	CY
Ditching/Trenching	X	X	=		/ 27 =	CY
Other	X	X	=		/ 27 =	CY
MATERIAL DESTINATION:					TOTAL VOLUME:	CY

Disclaimer

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The permittee verifies, acknowledges and agrees by their signature that:

- 1) If this permit is for installation of a dwelling, the dwelling is/will be served by potable water;
- 2) The property owner is the owner of this Whatcom County Permit;
- 3) The signatory is the property owner or someone who has permission to represent the property owner in this transaction;
- 4) All construction is to be done in accordance with Whatcom County codes or ordinances-*referenced codes and ordinances are available for review at Whatcom County Planning and Development Services*;
- 5) This Whatcom County Permit does not permit or approve any violation of federal, state or local laws, codes or ordinances;
- 6) Submission of plans or additional information and subsequent approval may be required before this application can be processed;
- 7) Notwithstanding that this application has been submitted in the name of a company, I personally guarantee payment (or guarantee payment on behalf of the client that I am representing, noted on the submitted Agent Authorization Form) of the fees accrued according to the terms listed in the Whatcom County Unified Fee Schedule, including the Application of Fees from Different UFS Schedule Policy PL1-74-003Z, and agree to be bound personally as a principal and not as a surety. I recognize that my personal guarantee is part of the consideration for review of the application.

Print Name

Signature

Date

APPENDIX D
EXISTING RESERVOIR LEAD AND ASBESTOS
TESTING RESULTS



ANALYTICAL REPORT

PREPARED FOR

Attn: Lance Stevens
Evergreen Coating Engineers
6925 37th Ave SW
Seattle, Washington 98126

Generated 4/3/2023 4:31:00 PM

JOB DESCRIPTION

Division 7 Reservoir Demolition

JOB NUMBER

580-124927-1

Eurofins Seattle

Job Notes

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The data in the report relate to the field sample(s) as received by the laboratory and associated QC. All results have been reviewed and have been found to be compliant with laboratory and accreditation requirements, with the exception of the noted deviation(s). For questions, please contact the Project Manager.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization



Generated
4/3/2023 4:31:00 PM

Authorized for release by
Laura Schick, Project Manager
Laura.Schick@et.eurofinsus.com
(253)922-2310

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Case Narrative

Client: Evergreen Coating Engineers
Project/Site: Division 7 Reservoir Demolition

Job ID: 580-124927-1

Job ID: 580-124927-1

Laboratory: Eurofins Seattle

Narrative

Job Narrative 580-124927-1

Receipt

The samples were received on 3/20/2023 11:02 AM. Unless otherwise noted below, the samples arrived in good condition. The temperature of the cooler at receipt was 16.4° C.

Receipt Exceptions

The following samples were received at the laboratory outside the required temperature criteria of less than 6 degrees C: Division 7 Reservoir Interior (580-124927-1) and Division 7 Reservoir Exterior (580-124927-2). There was no cooling media present in the cooler.

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. Analyses were listed under Sample Specific Notes instead of the proper location and the COC was not relinquished by the client.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Evergreen Coating Engineers
Project/Site: Division 7 Reservoir Demolition

Job ID: 580-124927-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample Results

Client: Evergreen Coating Engineers
Project/Site: Division 7 Reservoir Demolition

Job ID: 580-124927-1

Client Sample ID: Division 7 Reservoir Interior

Lab Sample ID: 580-124927-1

Date Collected: 03/16/23 00:01

Matrix: Solid

Date Received: 03/20/23 11:02

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.7	J	4.2	0.35	mg/Kg		03/30/23 14:57	03/31/23 19:53	1
Barium	290		0.70	0.11	mg/Kg		03/30/23 14:57	03/31/23 19:53	1
Cadmium	0.17	J	1.4	0.068	mg/Kg		03/30/23 14:57	03/31/23 19:53	1
Chromium	8.5		1.8	0.30	mg/Kg		03/30/23 14:57	03/31/23 19:53	1
Lead	17000		42	6.2	mg/Kg		03/30/23 14:57	04/03/23 14:17	20
Selenium	ND		7.0	0.55	mg/Kg		03/30/23 14:57	03/31/23 19:53	1
Silver	ND		3.5	0.78	mg/Kg		03/30/23 14:57	03/31/23 19:53	1

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.036	J	0.055	0.017	mg/Kg		03/28/23 11:55	03/29/23 16:10	1

Client Sample Results

Client: Evergreen Coating Engineers
Project/Site: Division 7 Reservoir Demolition

Job ID: 580-124927-1

Client Sample ID: Division 7 Reservoir Exterior

Lab Sample ID: 580-124927-2

Date Collected: 03/16/23 00:01

Matrix: Solid

Date Received: 03/20/23 11:02

Method: SW846 6010D - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.1	J	19	1.6	mg/Kg		03/30/23 14:57	03/31/23 20:05	1
Barium	62000		32	5.1	mg/Kg		03/30/23 14:57	03/31/23 20:10	10
Cadmium	ND		6.4	0.31	mg/Kg		03/30/23 14:57	03/31/23 20:05	1
Chromium	2400		8.3	1.4	mg/Kg		03/30/23 14:57	03/31/23 20:05	1
Lead	15000		9.6	1.4	mg/Kg		03/30/23 14:57	03/31/23 20:05	1
Selenium	ND		32	2.5	mg/Kg		03/30/23 14:57	03/31/23 20:05	1
Silver	ND		16	3.6	mg/Kg		03/30/23 14:57	03/31/23 20:05	1

Method: SW846 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.11	0.032	mg/Kg		03/28/23 11:55	03/29/23 16:17	1

QC Sample Results

Client: Evergreen Coating Engineers
Project/Site: Division 7 Reservoir Demolition

Job ID: 580-124927-1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 580-421878/22-A

Matrix: Solid

Analysis Batch: 422123

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 421878

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		3.0	0.25	mg/Kg		03/30/23 14:57	03/31/23 19:23	1
Barium	ND		0.50	0.079	mg/Kg		03/30/23 14:57	03/31/23 19:23	1
Cadmium	ND		1.0	0.049	mg/Kg		03/30/23 14:57	03/31/23 19:23	1
Chromium	ND		1.3	0.22	mg/Kg		03/30/23 14:57	03/31/23 19:23	1
Lead	ND		1.5	0.22	mg/Kg		03/30/23 14:57	03/31/23 19:23	1
Selenium	0.460	J	5.0	0.40	mg/Kg		03/30/23 14:57	03/31/23 19:23	1
Silver	ND		2.5	0.56	mg/Kg		03/30/23 14:57	03/31/23 19:23	1

Lab Sample ID: LCS 580-421878/23-A

Matrix: Solid

Analysis Batch: 422123

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 421878

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	50.0	51.8		mg/Kg		104	80 - 120
Barium	50.0	52.6		mg/Kg		105	80 - 120
Cadmium	50.0	51.7		mg/Kg		103	80 - 120
Chromium	50.0	51.4		mg/Kg		103	80 - 120
Lead	50.0	51.4		mg/Kg		103	80 - 120
Selenium	50.0	50.8		mg/Kg		102	80 - 120
Silver	50.0	53.1		mg/Kg		106	80 - 120

Lab Sample ID: LCSD 580-421878/24-A

Matrix: Solid

Analysis Batch: 422123

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 421878

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	50.0	53.7		mg/Kg		107	80 - 120	4	20
Barium	50.0	54.6		mg/Kg		109	80 - 120	4	20
Cadmium	50.0	53.5		mg/Kg		107	80 - 120	4	20
Chromium	50.0	53.1		mg/Kg		106	80 - 120	3	20
Lead	50.0	53.3		mg/Kg		107	80 - 120	4	20
Selenium	50.0	52.5		mg/Kg		105	80 - 120	3	20
Silver	50.0	55.7		mg/Kg		111	80 - 120	5	20

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 580-421593/24-A

Matrix: Solid

Analysis Batch: 421794

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 421593

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.030	0.0090	mg/Kg		03/28/23 11:55	03/29/23 15:24	1

Lab Sample ID: LCS 580-421593/25-A

Matrix: Solid

Analysis Batch: 421794

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 421593

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.167	0.170		mg/Kg		102	80 - 120

Eurofins Seattle

QC Sample Results

Client: Evergreen Coating Engineers
Project/Site: Division 7 Reservoir Demolition

Job ID: 580-124927-1

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: LCSD 580-421593/26-A
Matrix: Solid
Analysis Batch: 421794

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 421593

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.167	0.163		mg/Kg		98	80 - 120	4	20

Lab Chronicle

Client: Evergreen Coating Engineers
Project/Site: Division 7 Reservoir Demolition

Job ID: 580-124927-1

Client Sample ID: Division 7 Reservoir Interior

Lab Sample ID: 580-124927-1

Date Collected: 03/16/23 00:01

Matrix: Solid

Date Received: 03/20/23 11:02

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3050B			421878	DLV	EET SEA	03/30/23 14:57
Total/NA	Analysis	6010D		1	422123	JLS	EET SEA	03/31/23 19:53
Total/NA	Prep	3050B			421878	DLV	EET SEA	03/30/23 14:57
Total/NA	Analysis	6010D		20	422154	JLS	EET SEA	04/03/23 14:17
Total/NA	Prep	7471A			421593	DLV	EET SEA	03/28/23 11:55
Total/NA	Analysis	7471A		1	421794	JL	EET SEA	03/29/23 16:10

Client Sample ID: Division 7 Reservoir Exterior

Lab Sample ID: 580-124927-2

Date Collected: 03/16/23 00:01

Matrix: Solid

Date Received: 03/20/23 11:02

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3050B			421878	DLV	EET SEA	03/30/23 14:57
Total/NA	Analysis	6010D		1	422123	JLS	EET SEA	03/31/23 20:05
Total/NA	Prep	3050B			421878	DLV	EET SEA	03/30/23 14:57
Total/NA	Analysis	6010D		10	422123	JLS	EET SEA	03/31/23 20:10
Total/NA	Prep	7471A			421593	DLV	EET SEA	03/28/23 11:55
Total/NA	Analysis	7471A		1	421794	JL	EET SEA	03/29/23 16:17

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Evergreen Coating Engineers
Project/Site: Division 7 Reservoir Demolition

Job ID: 580-124927-1

Laboratory: Eurofins Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C788	07-13-23

1
2
3
4
5
6
7
8
9
10
11

Sample Summary

Client: Evergreen Coating Engineers
Project/Site: Division 7 Reservoir Demolition

Job ID: 580-124927-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-124927-1	Division 7 Reservoir Interior	Solid	03/16/23 00:01	03/20/23 11:02
580-124927-2	Division 7 Reservoir Exterior	Solid	03/16/23 00:01	03/20/23 11:02

1

2

3

4

5

6

7

8

9

10

11

[illegible]

Login Sample Receipt Checklist

Client: Evergreen Coating Engineers

Job Number: 580-124927-1

SDG Number:

Login Number: 124927

List Number: 1

Creator: Groves, Elizabeth

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice per client request.
Cooler Temperature is acceptable.	True	Cooler temperature outside limits, acceptable per client data quality objectives
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	Refer to Job Narrative for details.
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	No time on COC or sample containers
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

LATE 23.5056

CAZ Environmental Services

2201 Humboldt Street, Bellingham, WA 98225

360-389-1056 info@cazenviro.com

Bulk Sample Chain of Custody

Report results to: info@cazenviro.com 360-389-1056

Client: LAKE WHATCOM WATER & SEWER ENGINEER

Analysis Required:

Company Name: C/O KRISTIN HEMENWAY DISTRICT

PLM 1 hour: X



Billing Address: 1220 LAKEWAY DR. BELLINGHAM 98229

PLM 1 day: 1000 CT

Phone: 360-734-9224

Email: KRISTIN.HEMENWAY@LWNSD.ORG

Sample Site: WATER
DIVISION 7 RESERVOIR - GRAND VIEW LANE
SUDDEN VALLEY, WA

	Signature	Date	Time
Sampled by:	KRISTIN HEMENWAY	12-20-23	12:45 PM
Delivered by:	KRISTIN HEMENWAY	12-20-23	2:45 PM
Received by:	Margnann Tripp	12/20/23	2:52 PM
Received by:		12/21/23	1:00 PM
Analyzed by:		12/21/23	2:20 PM

Seq.#	Client Sample	Seq.#	Client Sample	Seq.#	Client Sample	Seq.#	Client Sample
1	DIVISION 7	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:



Washington Asbestos Testing LLC ▪ watestingllc.com
11200 Kirkland Way Ste. 340A, Kirkland, WA 98033 ▪ (425) 658-7286
12811 8th Ave W Ste. B101, Everett, WA 98204 ▪ (425) 374-8706
15 S Oregon Ave Ste. 204, Tacoma, WA 98409 ▪ (253) 301-1852

Batch #: WATE2305056

NVLAP Lab Code 600040-0

Asbestos Analysis of Bulk Materials by App. E to Sub. E of 40 CFR Part 763 and EPA 600/R-93/116
Methods Using Polarized Light Microscopy

Attn: **Paul Palu**
CAZ Environmental Services
2201 Humboldt St., Bellingham, WA 98225

Office Phone: (360) 389-1056
Date Received: 12/21/2023
Date Analyzed: 12/21/2023
Samples Received: 1
Samples Analyzed: 1

Project: **LAKE WHATCOM WATER & SEWER DISTRICT**
DIVISION 7 WATER RESERVOIR - GRAND VIEW LANE SUDDEN VALLEY, WA

Analyzed By

David Henry

Approved By

Approved Signatory (If Necessary)

SEQ#	SAMPLE ID	LAYER	DESCRIPTION	%	NON-ASBESTOS FIBERS	%	NON-FIBROUS	%	ASBESTOS TYPE
1	DIVISION 7	1	Gray cementitious material with sand and paint	2%	Cellulose	98%	Non-fibrous (Other)		None Detected

The results given relate only to the items tested. The results apply to the sample(s) as received.

Reports must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

APPENDIX E
GEOTECHNICAL REPORT

Geotechnical Engineering Services

Lake Whatcom Water and Sewer District
Division 7 Reservoir Seismic Upgrade
Bellingham, Washington

for

Wilson Engineering, LLC

June, 30, 2022



GEOENGINEERS 
Earth Science + Technology

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File No. 0430-014-00

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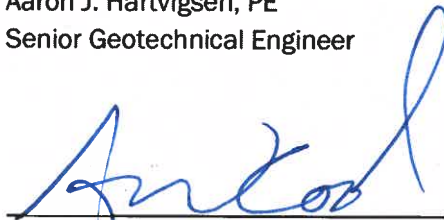
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1.0 INTRODUCTION

This report presents the results of our geotechnical engineering services for the proposed Division 7 Reservoir Seismic Upgrade project for the Lake Whatcom Water and Sewer District (LWWSD) to be located in the Sudden Valley area of Bellingham, Washington. The site is shown relative to surrounding physical features in the Vicinity Map, Figure 1, and the Site and Exploration Plan, Figure 2.

Our services were completed in general accordance with our scope and fee estimate dated November 15, 2021. Our specific scope of services included:

- Reviewing existing geotechnical information and available references for the site and project vicinity;
- Completing test pits to characterize the subsurface conditions at the site;
- Completing a geologic reconnaissance of the steep slope to evaluate site conditions that could affect slope stability and tank design;
- Completing laboratory testing on selected soil samples obtained from the explorations;
- Completing geotechnical analyses as necessary to support the project; and
- Preparing this geotechnical engineering report.

2.0 PROJECT DESCRIPTION

Our understanding of the project is based on discussions with Wilson Engineering, LLC. The site is located on an undeveloped hilltop area northeast of the existing water tank southeast of Swallow Circle in the Sudden Valley neighborhood of Bellingham, Washington.

The proposed project consists of constructing two new cast-in-place concrete water tanks with Mt. Baker Silo water reservoirs (237,900 gallons, each). It is our understanding that the anticipated tank dimensions are approximately 32 feet in diameter and approximately 45 feet tall with a base elevation of 693 feet. As currently envisioned, the proposed tanks will be located on a ridgetop area, northeast of the existing tank. Site grades across the proposed tank footprints vary by approximately 5 feet, with a steep slope to the south. Due to the variation in topography across the site, excavation into sandstone bedrock will be necessary to create a level pad and uniform bearing surface for the new structures.

3.0 SITE CONDITIONS

3.1. Surface Conditions

The site is surrounded by Camp Firwood property. The proposed tank site is currently undeveloped. Vegetation at the site consists of small to large evergreen and deciduous trees with associated understory vegetation. A gravel access road runs north of the project site. The current access road was recently reinforced during construction of a cell phone tower located northeast of the site. The existing water tank is located southwest of the new tank site.

3.2. Geology

We reviewed a U. S. Geologic (USGS) map for the project area, “Geologic Map of the Bellingham 1:100,000 Quadrangle, Washington” by T.J. Lapen (2000). The area is mapped as Chuckanut Formation bedrock.

The Chuckanut Formation consists of sandstone, conglomerate, shale, and coal. The shale locally contains fossils including leaves, palm fronds, and whole tree trunks. These deposits originated as alluvial flood plain deposits. The sandstone is variable in weathering, orientation, and rock quality. The sandstone is relatively hard and strong where unweathered. The formation has been heavily folded by tectonic forces, and then partially eroded and weathered from glacial activity. The site is mapped with bedding dipping 25 degrees to the southeast. In the local vicinity, the Chuckanut Formation is sometimes overlain by a mantle of undifferentiated glacial soils.

3.3. Subsurface Explorations and Laboratory Testing

Subsurface soil and groundwater conditions were evaluated on February 17, 2022 by excavating five test pits. The test pits were completed to depths ranging from 4½ to 7 feet below the ground surface (bgs) using a tracked excavator. The approximate locations of the explorations are shown in Figure 2. Details of the field exploration program and the test pit logs are presented in Appendix A. Details of the laboratory testing program are also presented in Appendix A.

3.4. Subsurface Conditions

The general soil profile at the site consists of topsoil and weathered horizon overlying weathered bedrock “residuum” overlying competent unweathered bedrock.

- A layer of forest duff/topsoil was encountered at the ground surface in each of the test pits extending to approximately 6 to 12 inches bgs.
- Underlying the topsoil layer, a weathered horizon was encountered consisting of rust brown loose silty sand to medium stiff sandy silt.
- Weathered bedrock residuum was encountered in our explorations underlying the weathered horizon. The residuum is a soil-like, decomposed weathered bedrock, and typically consisted of medium dense brown silty fine to coarse sand with sandstone fragments and extended to depths of 2 to 6 feet bgs.
- Competent, relatively unweathered bedrock was encountered in all of our test pits. The bedrock encountered consisted of brown sandstone. The upper surface of the bedrock was able to be excavated and could be penetrated up to 18 inches at the bottom of the test pit with the available equipment.

3.5. Groundwater Conditions

Groundwater seepage was not encountered within the depth of our test pits. Perched groundwater seepage can occur within the weathered horizon and/or weathered bedrock material overlying the lower permeability rock surface. Groundwater conditions should be expected to vary as a function of season, precipitation, and other factors.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1. Summary of Geotechnical Considerations

We conclude that construction of the proposed water storage tanks can be successfully completed from a geotechnical perspective provided the considerations presented in this report are incorporated into the project planning and design. A summary of the primary geotechnical considerations is provided below. The summary is presented for introductory purposes only and should be used in conjunction with the complete recommendations presented in this report.

- The proposed water storage tanks may be supported on shallow foundations. Shallow foundation for the water storage tanks supported on the weathered/unweathered hard sandstone bedrock or compacted bedrock residuum or structural fill extending to these layers in accordance with our recommendations can be designed using an allowable bearing pressure of 4,000 pounds per square foot (psf).
- The site grading is planned to be accomplished by cutting/leveling off the top of the hillside.
- The site is expected to require export or stockpiling excavated soil/bedrock. On-site silty soils are very susceptible to disturbance during wet conditions. We do not recommend on-site soils for use as structural fill below the proposed water storage tanks. If construction occurs during wet weather, the contractor will need to protect the soil stockpiles from rainfall. If soil stockpiles become wetter than the optimum moisture content, it may be necessary to export the soil off site and bring in drier material.
- If a significant quantity of rock excavation will be required. The rock could be processed/crushed and reused as structural fill for access road or other site grading requirements.
- The site is underlain at shallow depths by sandstone bedrock which has very low permeability. Infiltration is not considered feasible, and dispersion is recommended for stormwater management.
- Excavation for pipeline installation and tank foundation through zones of perched groundwater will create seepage zones that will be subject to sloughing and erosion. Mitigation could include interceptor trenches with sumps and pumps, erosion protection with geotextile fabric and rock, or other measures.

These and other geotechnical considerations are discussed further, and recommendations pertaining to the geotechnical aspects of the project are presented in the following sections of this report.

4.2. Geologic Hazards

The Whatcom County Critical Areas Ordinance (CAO) defines requirements for evaluation of geologic hazards including landslide, seismic, alluvial fan, erosion, volcanic, tsunami and mine hazards. The slope nearest to the south of the proposed tank locations is inclined at approximately 2.5H:1V (22 degrees, 40 percent), exceeds 10 feet of vertical relief. Therefore, the slope meets the CAO definition of a potential landslide hazard area. However, there is an exception in Whatcom County Code (WCC) 16.16.310 C.1.a.xii “any area with a slope of 40 percent or steeper with a vertical relief of 10 or more feet except areas composed of competent bedrock or properly engineered slopes designed and approved by a geotechnical engineer licensed in the state of Washington and experienced with the site.”

We evaluated the slope while onsite and did not observe any significant evidence of localized or global instability. The site is mapped as bedrock which was confirmed in our explorations. Additionally, the proposed site modifications will not alter the site in a manner that would increase geologic hazard at the

site or adjacent properties. The site does not meet the CAO definition for seismic, alluvial fan, erosion, volcanic, tsunami or mine hazards. In our opinion, no additional evaluation of geologic hazards is necessary at this site.

4.3. Seismic Design Considerations

4.3.1. General Seismicity

The site is located within the Puget Sound region, which is seismically active. Seismicity in this region is attributed primarily to the interaction between the Pacific, Juan de Fuca and North American plates. The Juan de Fuca plate is subducting beneath the North American plate. It is thought that the resulting deformation and breakup of the Juan de Fuca plate might account for the deep focus earthquakes in the region. Hundreds of earthquakes have been recorded in the Puget Sound area. In recent history, four of these earthquakes were large events: (1) in 1946, a Richter magnitude 7.2 earthquake occurred in the Vancouver Island, British Columbia area; (2) in 1949, a Richter magnitude 7.1 earthquake occurred in the Olympia area; (3) in 1965, a Richter magnitude 6.5 earthquake occurred between Seattle and Tacoma; and (4) in 2001, a Richter magnitude 6.8 earthquake occurred near Olympia.

Research has concluded that historical large magnitude subduction-related earthquake activity has occurred along the Washington and Oregon coasts. Evidence suggests several large magnitude earthquakes (Richter magnitude 8 to 9) have occurred in the last 1,500 years, the most recent of which occurred about 300 years ago. Local design practice in Puget Sound and local building codes consider the local seismic conditions including local known faults in the design of structures.

4.3.2. Surface Fault Rupture

The closest active fault identified by the USGS online fault and fold database is the north-west trending Birch Bay fault, located approximately 14 miles to the northwest. It does not appear that there are faults crossing the proposed tank site. Because the site is outside of mapped fault areas, and no other known active faults have been mapped in the project area, it is our opinion that the potential for surface fault rupture is low.

4.3.3. Liquefaction Potential

Liquefaction is a phenomenon where soils experience a rapid loss of internal strength as a consequence of strong ground shaking. Ground settlement, lateral spreading and/or sand boils may result from soil liquefaction. Structures supported on liquefied soils could suffer foundation settlement or lateral movement that could be severely damaging to the structures.

Conditions favorable to liquefaction occur in loose to medium dense, clean to moderately silty sand that is below the groundwater level. Based on our evaluation of the subsurface conditions at this site and our recommendations, the facilities will be founded on hard rock which is not at risk of liquefaction. Therefore, no mitigation strategies are necessary in our opinion.

4.3.4. 2018 IBC and AWWA Seismic Design Information

If structural elements for the proposed improvements will be designed utilizing the 2018 International Building Code (IBC), we recommend the project site be classified as Site Class C. The design parameters for the 2018 IBC are summarized in Table 1. These values are based on an earthquake event that has a 2 percent probability of exceedance in a 50-year period (2,475-year return period).

TABLE 1. SPECTRAL RESPONSE ACCELERATIONS (SRAs)

(SRA) and Site Coefficients	Short Period	1 Second Period
Mapped SRA	$S_s = 0.966$	$S_1 = 0.341$
Site Coefficients	$F_a = 1.2$	$F_v = 1.5$
Max. Considered Earthquake SRA	$S_{MS} = 1.16$	$S_{M1} = 0.511$
Design SRA	$S_{DS} = 0.773$	$S_{D1} = 0.341$

Note: Soil Profile Type C Description: Very Dense Soil and Soft Rock Profile (N>50)

In addition to the seismic design parameters defined by the 2018 IBC, the American Water Works Association (AWWA) defines a “Seismic Use Group” and “Seismic Importance Factor, I_E ” that are assigned to the water tank based on its intended use and expected performance. As defined by AWWA D110-04, “Seismic Use Group III shall be used for tanks that provide direct service to facilities that are deemed essential for post-earthquake recovery and essential to life, health, and safety of the public, including post-earthquake fire suppression.” Accordingly, a Seismic Importance Factor, I_E of 1.5 is appropriate. The design earthquake motion or maximum considered earthquake (MCE) ground motion is also defined by an event with a 2 percent probability of exceedance within a 50-year period; which for the tank site corresponds to a Magnitude 6.78 design-level earthquake with a peak horizontal ground acceleration (PGA) of 0.43g generated from a source approximately 25 miles from the site.

4.4. Shallow Foundations

We anticipate that the new water storage tank will be constructed on a mat foundation designed by Baker Silo, LLC. The proposed tank should be supported on shallow foundations bearing on undisturbed dense, unweathered sandstone bedrock, compacted bedrock residuum or structural fill extending to these soils/rock as described below. Our recommendations for foundation design are presented in the following sections.

4.4.1. Footing Design and Subgrade Preparation

The mat foundation for the new water storage tanks should be designed using an allowable soil bearing value of 4,000 psf for footings bearing directly on undisturbed, unweathered sandstone or compacted bedrock residuum or structural fill extending to these layers. Because of the potential variable nature of sandstone bedrock surface, a mixed bearing condition of bedrock and/or weathered bedrock or bedrock residuum may occur. To provide a more uniform bearing condition and avoid hard spots, we recommend a minimum of 12-inches of structural fill below the foundation where bedrock is encountered during foundation preparation.

This allowable soil bearing value applies to the total of dead and long-term live loads and may be increased by up to one-third for wind or seismic loads. We recommend that the tanks be founded a minimum of 18-inches below site grades for frost protection.

If soft areas are present at the footing subgrade elevation, the soft areas should be removed and replaced with compacted structural fill at the direction of the Geotechnical Engineer. In such instances, the zone of structural fill should extend laterally beyond the footing edges a horizontal distance at least equal to the thickness of the fill and a minimum of 1 foot beyond the edge of foundation.

4.4.2. Foundation Setback from Slope

The slope to the south does not meet a landslide hazard based on our review. However, we recommend a minimum set back of 10 feet from the crest of this slope for any part of the proposed water tank foundations.

4.4.3. Settlement

Provided all loose soil is removed and the subgrade is prepared as recommended in the “Earthwork” section of this report, we estimate the total settlement of shallow foundations resulting from static loading of the water storage tank structure will be on the order of $\frac{1}{2}$ to $\frac{3}{4}$ inch. Differential settlement across the width of the tanks would be expected to be half this amount or less than about $\frac{1}{4}$ inch in 50 feet. The settlements are expected to occur rapidly, essentially as loads are applied. These settlement estimates assume that all footings are founded on limited thickness of compacted crushed rock overlying bedrock.

4.4.4. Lateral Resistance

Lateral foundation loads can be resisted by a combination of friction between the base of the foundation and the supporting soil, and by the passive lateral resistance of the soil surrounding the embedded portions of the footings. A coefficient of friction between concrete and crushed rock foundation soil of 0.45 and a passive lateral resistance of 300 pounds per cubic foot (pcf, triangular distribution) may be used. The friction coefficient and passive lateral resistance are allowable values and include a factor of safety of 1.5 or greater.

4.4.5. Footing Drainage

Although not encountered in our test pit explorations, perched groundwater may be encountered at the site. Perched ground water is usually encountered where less permeable materials are found over the denser soil layers or bedrock. It is also common to encounter groundwater at the bedrock interface or within bedrock fractures.

Standard of practice would be to include a perimeter footing drain around the uphill portion of the water storage tank to capture perched groundwater. A footing drain could be included as an option and potentially deleted based on conditions observed during construction. Any perimeter or underslab drainage system pipes should be routed to an appropriate discharge point. Appropriate clean-outs for drain pipe maintenance should be installed. A larger-diameter pipe will allow for easier maintenance of drain systems.

4.5. Stormwater Considerations

Final site grades should be sloped to drain away from proposed structures. The on-site soils encountered at relatively shallow depth are considered relatively impermeable. The site does not meet feasibility criteria for infiltration per the Stormwater Management Manual for Western Washington. Surface water will likely be handled by means of dispersion. Based on the undeveloped area surrounding the site, we anticipate that dispersion will generally mimic existing conditions.

4.6. Gravity Wall Considerations

A retaining wall is proposed to reduce the footprint of the proposed cut slope along the eastern portion of the site. At this time the cut slope is shown for planning purposes at 1H:1V (horizontal to vertical) with a 4 foot exposed wall at the toe. Based on the observed site conditions, the cut is expected to extend through soil overburden and into the underlying bedrock and wall height and backslope gradient may be adjusted

for final design and conditions encountered in the field. Gravity walls are well suited site to retain the proposed cut, either to retain soil, as facing for rock cuts, or to provide catchment for potential rockfall in steepened cuts. The final wall geometry and gravity structure type has not been selected. We recommend that the gravity wall be designed based on the following parameters and design considerations.

4.6.1. Soil Properties

The design parameters summarized in Table 2 should be used for design of the proposed gravity block wall. The soil strength parameters reflect the assumption that the base of the wall will be within competent sandstone bedrock. Wall backfill should consist of imported crushed rock compacted to at least 90 percent of the maximum dry density (MDD) obtained using ASTM International (ASTM) D 1557.

TABLE 2. GRAVITY BLOCK WALL DESIGN PARAMETERS

Soil Properties	Retained Soil (Crushed Rock)	Foundation Bearing Soil
Unit Weight (pcf)	125	135
Friction Angle (deg)	36	40
Cohesion (psf)	0	0

4.6.2. Leveling Pad

We recommend that the base row of the wall blocks be supported on compacted crushed gravel leveling pad conforming to Section 9.03-9(3) (crushed surfacing top course or base course) of the current Washington State Department of Transportation (WSDOT) Standard Specifications with minimum thickness of 3 inches. The leveling pad should be compacted to 95 percent of the MDD as determined by ASTM D 1557 (Modified Proctor) test procedure.

4.6.3. Wall Drainage

For purposes of internal wall design, the groundwater level was assumed to be below the base of the wall and that the wall backfill consists of crushed rock that also serves as the drainage layer behind the wall. A suitable specification for backfill/drainage is WSDOT Standard Specification 9-03.9(2) Permeable Ballast, although other gradations of clear crushed rock may be suitable.

4.6.4. Wall Embedment

We recommend that the wall toe be embedded below the grade in front of the wall based on anticipated wall height and slope height. For planning purposes, we recommend a minimum of 6-inches for walls up to 6 feet high, or that embedment necessary based on stability requirements (e.g., sliding resistance).

4.6.5. Earthquake Loads

We recommend that the seismic loading be designed in accordance with the 2018 IBC. The 2018 IBC references the 2016 version of *Minimum Design Loads for Buildings and Other Structures* (American Society of Civil Engineers [ASCE] 7-16). Based on ASCE 7-16, the site modified PGA expected at the site from an earthquake with a 2 percent probability of exceedance in 50 years is approximately 0.41g. We recommend the internal stability of the wall be analyzed using a horizontal seismic coefficient of 0.2g.

4.6.6. Performance Limit Values

The performance limit values presented in Table 3 should be used as minimum safety factors for design of the gravity block wall.

TABLE 3. PERFORMANCE LIMIT VALUES

Criteria	Minimum Static Safety Factor	Minimum Seismic Safety Factor
Sliding	1.5	1.125
Overturning Stability	1.5	1.125
Bearing Capacity	2	1.5

4.6.7. Surcharge Loading

Surcharge loading should be considered behind the gravity wall due to the slope above. We do not anticipate construction equipment or traffic loading above the gravity wall.

4.7. Earthwork Considerations

4.7.1. Erosion and Sedimentation Control

Potential sources or causes of erosion and sedimentation depend upon construction methods, slope length and gradient, amount of soil exposed and/or disturbed, soil type, construction sequencing and weather. The project impact on erosion-prone areas can be reduced by implementing an erosion and sedimentation control plan. The plan should be designed in accordance with applicable city and/or county standards. The plan should incorporate basic planning principles including:

- Scheduling grading and construction to reduce soil exposure;
- Retaining existing vegetation whenever feasible;
- Revegetating or mulching denuded areas;
- Directing runoff away from denuded areas;
- Minimizing the length and steepness of slopes with exposed soils;
- Decreasing runoff velocities;
- Confining sediment to the project site; and
- Inspecting and maintaining control measures frequently.

We recommend that graded and disturbed soil slopes be tracked in place with the equipment running perpendicular to the slope contours so that the track marks provide a texture to help resist erosion and channeling. Some sloughing and raveling of slopes with exposed or disturbed soil/rock should be expected.

Temporary erosion protection should be used and maintained in areas with exposed or disturbed soils to help reduce the potential for erosion and reduce transport of sediment to adjacent areas. Temporary erosion protection should include the construction of a silt fence around the perimeter of the work area prior to the commencement of grading activities. Permanent erosion protection should be provided by re-establishing vegetation using hydroseeding and/or landscape planting.

Until the permanent erosion protection is established, and the site is stabilized, site monitoring should be performed by qualified personnel to evaluate the effectiveness of the erosion control measures and repair and/or modify them as appropriate. Provisions for modifications to the erosion control system based on monitoring observations should be included in the erosion and sedimentation control plan.

4.7.2. General Excavation

Topsoil, weathered silty soils, and sedimentary bedrock residuum and unweathered rock were observed in the explorations. We anticipate that these soils can be excavated with conventional excavation equipment, such as trackhoes or dozers although the hard unweathered rock will be difficult to excavate any significant depth. Larger horsepower excavators, or dozers with ripping teeth will be more efficient for the bedrock.

4.7.3. Rock Excavation

The sedimentary rock encountered at depths between 2½ and 6 feet bgs in test pits in the tank footprints is expected to extend the full depth of excavation. Based on observation of test pit excavation with an 85-series excavator, we anticipate that much of the upper surface of the rock is rippable. However, we recommend that the contractor be prepared to use a hydraulic ram to accomplish the proposed rock excavation if harder surfaces are encountered or more than 3 feet of excavation is required into the bedrock.

4.7.4. Clearing and Grubbing

Trees, brush and other vegetation, including topsoil with roots, should be stripped and removed from areas where structural fill will be placed. The stripped material should be placed in landscaping areas or taken off-site for disposal. Existing voids or new depressions created during site preparation should be cleaned of loose soil or vegetation and backfilled with structural fill.

4.7.5. Subgrade Preparation

GeoEngineers recommends that all subgrade surfaces be evaluated for suitability by a qualified geotechnical engineer or their representative. The tank subgrade should consist of sandstone bedrock. Any disturbed material should be removed, by hand if necessary. We do anticipate that a drainage and leveling layer consisting of crushed rock will be placed across the tank footprint. Proof-rolling is not necessary for bedrock subgrade areas. Soft zones noted during probing should be excavated and replaced with compacted structural fill. In the water tank footing area, a maximum of 2 feet overexcavation and crushed rock backfill is allowed based on using the high allowable bearing pressure discussed in this report. If deeper overexcavation is required, we recommend backfill with CDF.

4.7.6. Structural Fill Materials

4.7.6.1. GENERAL

Materials placed to support foundations and roadways or placed for drainage, are classified as structural fill for the purpose of this report. Structural fill material quality varies depending upon its use as described below:

1. At a minimum, structural fill should meet the criteria for common borrow as described in Section 9-03.14(3) of the WSDOT Standard Specifications. Common borrow will be suitable for use as structural fill in areas outside of the tank footprint and during dry weather conditions only. If structural

fill is placed during wet weather, the structural fill should consist of gravel borrow as described in Section 9-03.14(1) of the WSDOT Standard Specifications.

2. Structural fill placed below the water tank should consist of crushed surfacing base course in accordance with Section 9-03.9(3) of the WSDOT Standard Specifications, or other engineer approved crushed rock material. The upper 12 inches may be capillary break material as described below. Structural fill below foundation elements should extend out beyond the edge of the foundation a minimum of 1 foot and at a 1H:1V.
3. Structural fill placed to surround collector pipe (drain rock) and placed behind below grade walls should meet the criteria for gravel backfill for drains as described in Section 9-03.12(4) of the WSDOT Standard Specifications.
4. Structural fill placed as capillary break should be a clean crushed rock with a maximum particle size of 1½ inches, with negligible sand and silt (less than 3 percent).

4.7.6.2. ON-SITE SOILS

The upper 6 to 12 inches across the site generally contains a significant quantity of roots and organics and will not be suitable for reuse as structural fill. Below the topsoil/forest duff, most of the on-site soils have a high silt content and will be suitable for reuse as common borrow for the pipeline portion of the project only during dry weather and if screened for oversize material. If construction occurs during wet weather, the contractor will need to protect the soil stockpiles from rainfall. If soil stockpiles become wetter than the optimum moisture content, it may be necessary to export the soils off site and bring in drier material. On-site soils are not suitable for use as structural fill below the proposed water tank.

4.7.6.3. REUSE OF EXCAVATED SANDSTONE

Site grading will produce a quantity of excavated rock, which is desired to be reused onsite for fill and grading. It is proposed that the fill outside of the tank footprint consist of reused onsite rock placed and compacted with a 2H:1V finished slope configuration. We conclude that up to a 2H:1V fill embankment consisting of reused onsite rock can be constructed in a manner that is statically and seismically stable and adequate for fill embankment construction and driveway support with the recommendations below.

We recommend that onsite rock be processed so that 95 percent of the material has a maximum particle size of 12-inches. It is critical that only nominal soil is present in the fill matrix for a rock fill to allow rock to rock contact. We recommend that soil overburden be handled and compacted separately in accordance with the recommendations for soil below.

Onsite rock fill consisting of 12-inch minus material with nominal soil material should be placed in loose lifts less than 18 inches in thickness. The fill should be thoroughly compacted with a vibratory drum roller in accordance WSDOT Standard Specification 2-03.3(14)A Rock Embankment Construction which defines roller size and number of passes.

For fill on existing slopes 2H:1V and steeper, the face of each terrace for keying new fill to existing shall be a minimum of 1 foot wide and a maximum of 5 feet tall. The horizontal surfaces of the benches should be graded to a 0.05 percent slope to provide drainage. These are described in more detail in WSDOT Standard Specification 2-03.3(14) Embankment Construction.

4.7.6.4. FILL PLACEMENT AND COMPACTION CRITERIA

Structural fill should be mechanically compacted to a firm, non-yielding condition and the specified density. Structural fill should be placed in loose lifts not exceeding 10 inches in thickness, or lesser thickness as required to achieve the specified compaction. Each lift should be conditioned to the proper moisture content and compacted to the specified density before placing subsequent lifts. Structural fill should be compacted to the following criteria:

1. Structural fill placed behind below-grade walls should be compacted to 90 to 92 percent of the MDD as determined by ASTM D1557. Care should be taken when compacting fill near the face of below-grade walls to avoid over-compaction and overstressing the walls.
2. Structural fill placed outside of the tank structure footprint should be compacted to 90 percent of the MDD (ASTM D1557), except that the upper 2 feet of fill below final subgrade should be compacted to 95 percent of the MDD.
3. Structural fill placed below foundations including all structural fill below the tank foundations should be compacted to 95 percent of the MDD (ASTM D1557).
4. Any crushed rock placed below the footings to the water tank should be compacted to at least 98 percent of the MDD (ASTM D 1557) because of the 6,000 psf design pressure.

We recommend that the Geotechnical Engineer be present during proof-rolling and/or probing of the exposed subgrade and pavement subgrade soils, and placement of structural fill. The Geotechnical Engineer should evaluate the adequacy of the subgrade soils and identify areas needing further work, perform in-place moisture-density tests in the fill to evaluate if the work is being done in accordance with the compaction specifications, and advise on any modifications to procedure which may be appropriate for the prevailing conditions.

4.7.7. Temporary Slopes

The weathered horizon/weathered rock overburden and weathered glacial till soils encountered at the site are classified as Type C soil in accordance with the provisions of Title 296-155 WAC (Washington Administrative Code), Part N, "Excavation, Trenching, and Shoring." We recommend that temporary slopes in excess of 4 feet in height in these soils be inclined no steeper than 1½H:1V or supported by suitable shoring. The unweathered glacial till and weathered rock may be classified as "Type A" and inclined no steeper than ¾H:1V. Flatter slopes may be necessary if localized sloughing occurs. For open cuts at the site, we recommend that:

- No traffic, construction equipment, stockpiles or building supplies be allowed at the top of cut slopes within a distance of at least 5 feet from the top of the cut.
- Exposed soil along the slope be protected from surface erosion using waterproof tarps or plastic sheeting.
- Construction activities be scheduled so that the length of time the temporary cut is left open is kept as short as possible.
- Erosion control measures be implemented as appropriate such that runoff from the site is reduced to the extent practical.
- Surface water be diverted away from the excavation.
- The general condition of the slopes be observed periodically by a geotechnical engineer to confirm adequate stability.

Since the contractor has control of the construction operations, the contractor should be made responsible for the stability of cut slopes, as well as the safety of the excavations. All shoring and temporary slopes must conform to applicable local, state and federal safety regulations. Steeper slopes in the dense glacial till or rock can be used with approval by the geotechnical engineer, but usually require some monitoring for confirmation of soil types and slope stability.

4.7.8. Permanent Slopes

We recommend that permanent cut and fill slopes in soil be constructed no steeper than 2H:1V. To achieve uniform compaction, we recommend that fill slopes where required be overbuilt slightly and subsequently cut back to expose properly compacted fill.

For permanent rock cut slope excavation, we recommend that a 1H:1V cut slope be made in the weathered rock, and a 0.5H:1V cut slope be made in the hard rock. Actual conditions during excavation may require some field-based adjustments.

To reduce erosion, newly constructed soil slopes should be planted or hydroseeded shortly after completion of grading. Until the vegetation is established, some sloughing and raveling of the slopes should be expected. This may require localized repairs and reseeded. Temporary covering, such as clear heavy plastic sheeting, jute fabric, loose straw or excelsior matting should be used to protect the slopes during periods of rainfall. Even at these permanent slope inclinations in dense glacial soils and rock, areas of localized seepage could result in formation of rills or sloughing and erosion until permanent vegetation can be established.

The existing bedrock layer is considered relatively impermeable. Therefore, it is difficult to get topsoil and vegetation to maintain on even 2H:1V slopes. Sometimes it is helpful to include a rolled erosion control product (erosion control blanket) that is attached with heavy duty anchors.

4.7.1. Temporary Dewatering and Drainage Considerations

The contractor should anticipate shallow perched groundwater conditions will develop and seepage may enter excavations depending on the time of year construction takes place, especially in the winter and spring months. However, we expect this seepage water can be handled by digging interceptor trenches in the excavations and pumping from sumps. The seepage water, if not intercepted and removed from the excavations, will make it difficult to place and compact structural fill and may destabilize cut slopes. It may be necessary to stabilize seepage zones in cut slopes with geotextile fabric and rock or other measures to reduce sloughing and erosion.

All driveway and landscaped areas should be graded so surface drainage is directed away from the site structures to appropriate catch basins. Water collected in roof downspout lines must not discharge into or be routed to the perforated pipes intended for footing or wall drainage.

4.7.2. Weather Considerations

Most of the native soils contain a significant percentage of fines (silt and clay) and are moisture sensitive. When the moisture content of these soils is significantly above the optimum moisture content, these soils become muddy and unstable. During wet weather, operation of equipment on these soils will be difficult and it will be difficult to meet the required compaction criteria. Additionally, disturbance of the near surface soils should be expected if earthwork is completed during periods of wet weather.

The wet weather season generally begins in October and continues through May in the Puget Sound region; however, periods of wet weather may occur during any month of the year. The optimum earthwork period for these types of soils is typically June through September. If wet weather earthwork is unavoidable, we recommend that:

- Stockpiles of on-site soils that will be used as structural fill during wet weather be covered with plastic sheeting to protect them from rain.
- If on-site soils cannot be moisture conditioned to meet compaction requirements during wet weather, imported gravel borrow should be used as discussed previously.
- The ground surface in and around the work area be sloped so that surface water is directed away from the work area. The ground surface should be graded such that areas of ponded water do not develop. Measures should be taken by the contractor to prevent surface water from collecting in excavations and trenches. Measures should be implemented to remove surface water from the work area.

5.0 LIMITATIONS

We have prepared this report for the exclusive use of the Lake Whatcom Water and Sewer District and Wilson Engineering, LLC for the proposed Division 7 Reservoir Seismic Upgrade project. Our report and interpretations should not be construed as a warranty of the subsurface conditions.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to Appendix B titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.

6.0 REFERENCES

American Water Works Association. “Wire- and Strand-Wound, Circular, Prestressed Concrete Water Tanks.” ANSI/AWWA D110-13, Dec 1, 2013.

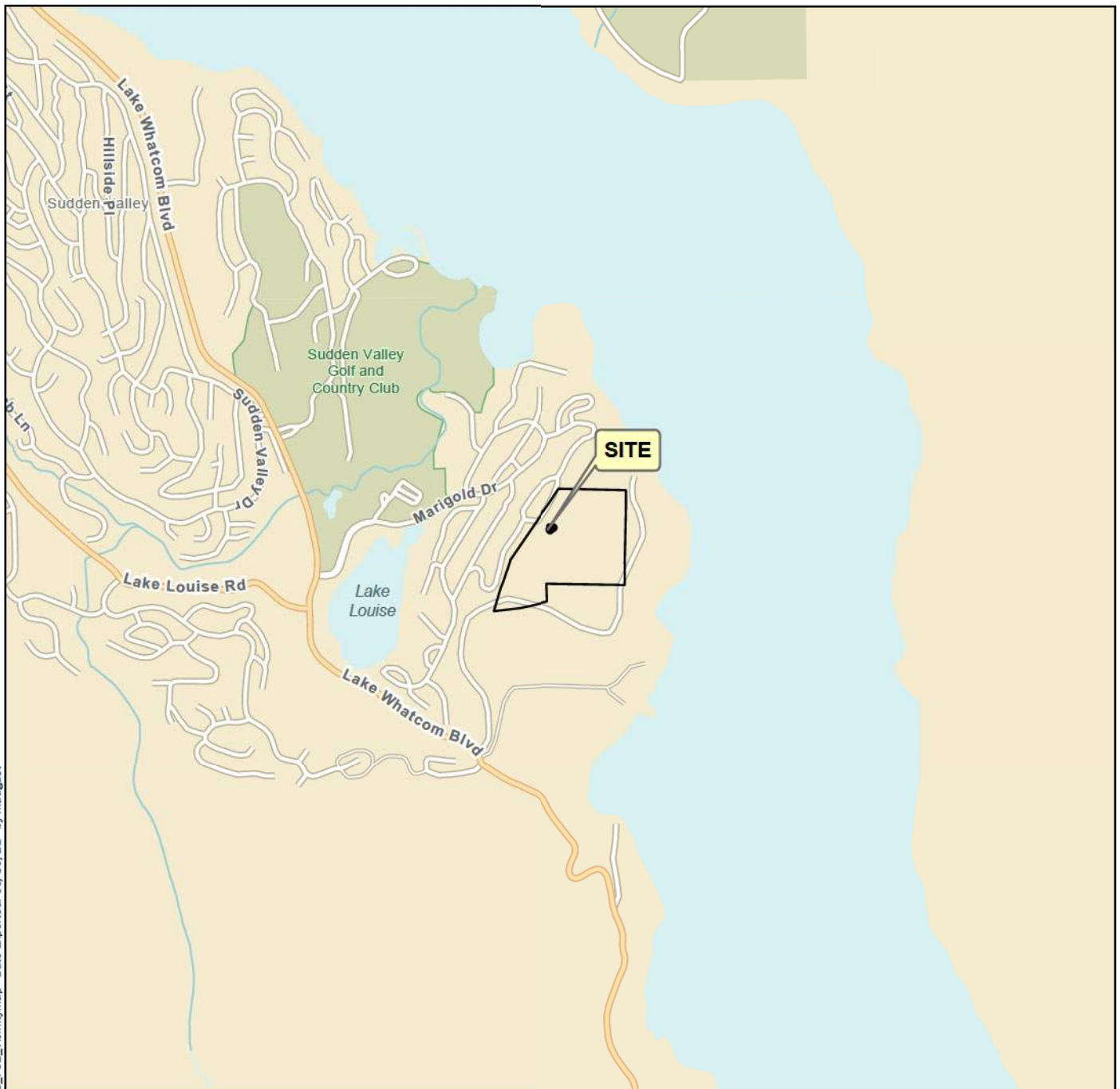
Lapen, T.J., 2000, “Geologic Map of the Bellingham 1:100,000 Quadrangle, Washington,” Washington State Department of Natural Resources.

International Code Council, “International Building Code,” 2018.

United States Geological Survey, “U.S. Seismic Design Maps,” accessed on March 16, 2022, <http://earthquake.usgs.gov/designmaps/us/application.php>.

United States Geological Survey, "Quaternary Fault and Fold Database for the United States," accessed on March 16, 2022.

Washington State Department of Transportation, "Standard Specifications for Road, Bridge and Municipal Construction," 2022.

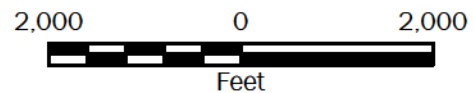


Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: ESRI

Projection: NAD 1983 UTM Zone 10N



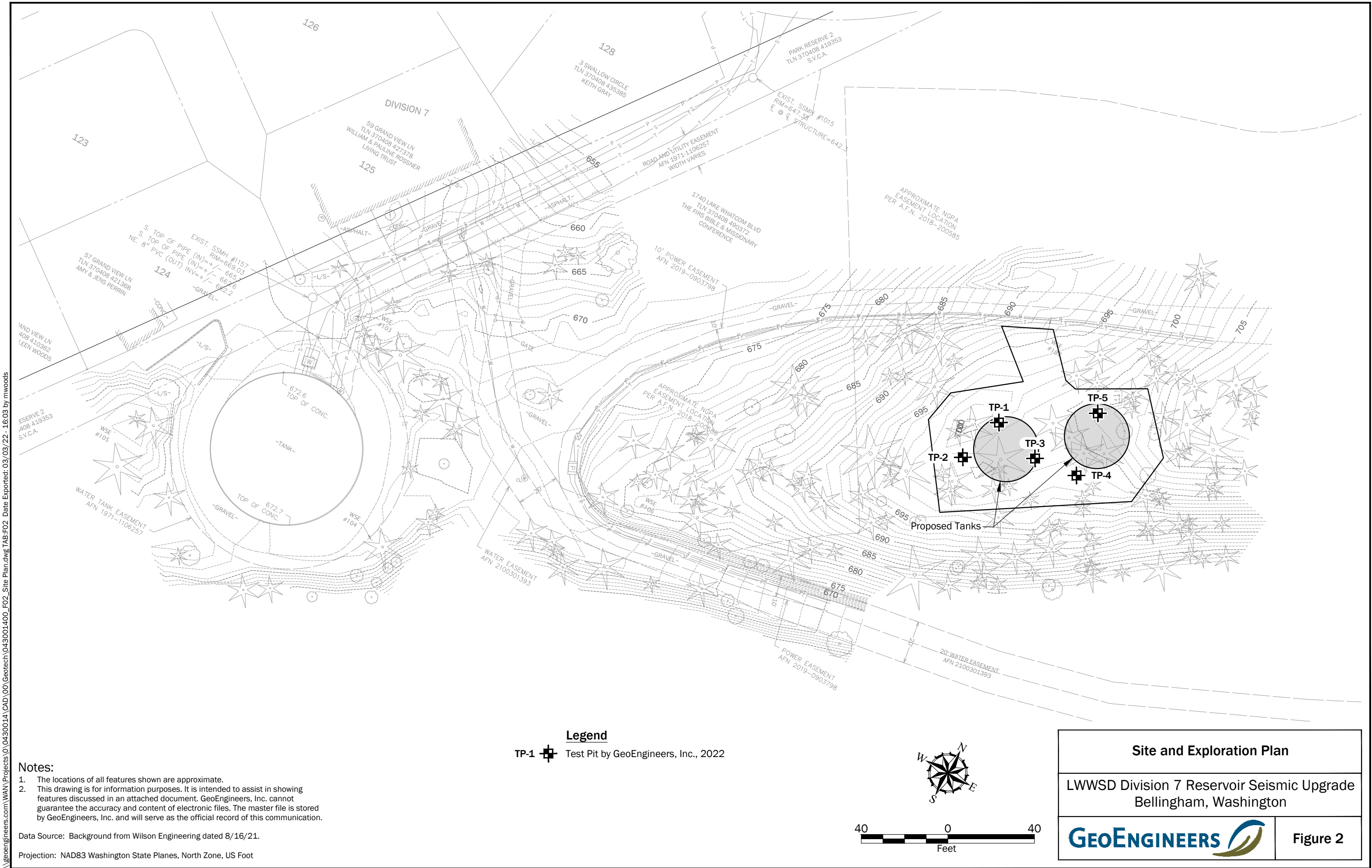
Vicinity Map

LWWS Division 7 Reservoir Seismic Upgrade
Bellingham, Washington



Figure 1

\\geoengineers.com\WAN\Projects\0430014\CAD\00\Geotech\043001400_F02_Site Plan.dwg TAB:F02 Date Exported: 03/03/22 - 16:03 by mwwoods



APPENDIX A

Field Explorations and Laboratory Testing

APPENDIX A

FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

Subsurface soil and groundwater conditions at the site were evaluated with an exploration program of test pits. Five test pits (TP-1 through TP-5) were completed on February 17, 2022 to depths ranging from 4½ to 7 feet below the ground surface (bgs) with a tracked excavator operated by RAM Construction. The explorations were located in the field by measuring from existing features so should be considered approximate.

Disturbed soil samples were generally obtained from the sides of the test pits and the bucket of the excavator. The samples were placed in plastic bags to maintain the moisture content and transported back to our laboratory for analysis and testing. The test pits were backfilled with the excavated material upon completion and tamped with the excavator bucket.

The explorations were continuously monitored by a geologist from our firm who examined and classified the soils encountered, obtained representative soil samples, observed groundwater conditions, and prepared a detailed log of each exploration. Soils encountered were classified visually in general accordance with ASTM international (ASTM) D-2488-90, which is described in Figure A-1. An explanation of the symbols for the test pits is also shown in Figure A-1.

The logs of the test pits are presented in Figures A-2 through A-6. The exploration logs are based on our interpretation of the field and laboratory data and indicate the various types of soils/rock encountered. It also indicates the depths at which these soils/rock or their characteristics change, although the change might actually be gradual. If the change occurred between samples, it was interpreted.

Laboratory Testing

Soil samples obtained from the explorations were transported to our laboratory and examined to confirm or modify field classifications, as well as to evaluate index properties of the soil samples. Representative samples were selected for laboratory testing consisting of moisture content determination and grain size distribution. The tests were performed in general accordance with ASTM test methods or other applicable procedures.

Percent Passing U.S. No. 200 Sieve

Selected samples were “washed” through the U.S. No. 200 mesh sieve to determine the relative percentages of coarse- and fine-grained particles in the soil. The percent passing value represents the percentage by weight of the sample finer than the U.S. No. 200 sieve. These tests were conducted to verify field descriptions and to determine the fines content for analysis purposes. The tests were conducted in general accordance with ASTM D 1140, and the results are shown in the exploration logs at the respective sample depths.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
		CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND
FINE GRAINED SOILS	SILTS AND CLAYS	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
		LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		LIQUID LIMIT LESS THAN 50		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
		LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
HIGHLY ORGANIC SOILS	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		CH	INORGANIC CLAYS OF HIGH PLASTICITY
		LIQUID LIMIT GREATER THAN 50		OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
		LIQUID LIMIT GREATER THAN 50		PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

Sampler Symbol Descriptions

	2.4-inch I.D. split barrel / Dames & Moore (D&M)
	Standard Penetration Test (SPT)
	Shelby tube
	Piston
	Direct-Push
	Bulk or grab
	Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS		TYPICAL DESCRIPTIONS
GRAPH	LETTER	
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact



Measured groundwater level in exploration, well, or piezometer



Measured free product in well or piezometer

Graphic Log Contact



Distinct contact between soil strata



Approximate contact between soil strata

Material Description Contact



Contact between geologic units



Contact between soil of the same geologic unit

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point lead test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
UU	Unconsolidated undrained triaxial compression
VS	Vane shear

Sheen Classification





NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

Key to Exploration Logs



Figure A-1

Date Excavated	2/17/2022	Total Depth (ft)	4.5	Logged By	AF2	Excavator		Groundwater not observed
				Checked By	AJH	Equipment	Hitachi 85 Tracked Excavator	Caving not observed
Surface Elevation (ft)	699	Easting (X)	1282035	Coordinate System	WA State Plane North			
Vertical Datum	NAVD88	Northing (Y)	627833	Horizontal Datum	NAD83 (feet)			

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
698	1	1			Duff	Dark brown silty fine to coarse sand with gravel and organic matter (roots, needles, pine cones) (forest duff/topsoil)			
		2			ML	Rust-brown sandy silt with gravel (medium dense, moist) (weathered horizon)			
697	2	3			SM	Light brown with iron staining silty fine to coarse sand (medium dense, moist) (bedrock residuum)	21	28	
696	3	4			Sandstone	Brown sandstone bedrock (hard, moist) (Chuckanut formation)			
695	4								

Test pit terminated at approximately 4½ feet due to practical refusal on bedrock

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot. Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Topographic Survey.

Log of Test Pit TP-1



Project: LWWSD Division 7 Reservoir Seismic Upgrade
Project Location: Bellingham, Washington
Project Number: 0430-014-00

Figure A-2
Sheet 1 of 1

Date Excavated	2/17/2022	Total Depth (ft)	4.5	Logged By	AF2	Excavator		Groundwater not observed
				Checked By	AJH	Equipment	Hitachi 85 Tracked Excavator	Caving not observed
Surface Elevation (ft)	699	Easting (X)	1282029	Coordinate System	WA State Plane North			
Vertical Datum	NAVD88	Northing (Y)	627811	Horizontal Datum	NAD83 (feet)			

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
698	1	1			Duff	Dark brown silty fine to coarse sand with gravel and organic matter (roots, needles) (loose, moist) (forest duff/topsoil)			
697	2	2			SM/ML	Light brown to rust-brown silty fine to medium sand to sandy silt (medium dense/stiff, moist) (weathered horizon)			
696	3	3			SM	Light brown silty fine to coarse sand with sandstone fragments (hard, dry to moist) (bedrock residuum)			
695	4	4			Sandstone	Brown sandstone bedrock (hard, moist) (Chuckanut formation)			

Test pit terminated at approximately 4½ feet due to practical refusal on bedrock

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Topographic Survey. Vertical approximated based on Topographic Survey.

Log of Test Pit TP-2



Project: LWWSD Division 7 Reservoir Seismic Upgrade
Project Location: Bellingham, Washington
Project Number: 0430-014-00

Figure A-3
Sheet 1 of 1

Date Excavated	2/17/2022	Total Depth (ft)	5	Logged By	AF2	Excavator			Groundwater not observed
				Checked By	AJH	Equipment	Hitachi 85 Tracked Excavator		Caving not observed
Surface Elevation (ft)	699	Easting (X)	1282058	Coordinate System	WA State Plane North				
Vertical Datum	NAVD88	Northing (Y)	627826	Horizontal Datum	NAD83 (feet)				

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
698	1		1	Duff	Dark brown silty fine to coarse sand with gravel and organic matter (roots, needles) (loose, moist) (forest duff/topsoil)	15	25		
			2	SM	Rust-brown silty fine to mediums and with occasional gravel (loose to medium dense, moist) (weathered horizon)				
697	2		3	SM	Light brown with iron staining silty fine to medium sand with sandstone fragments (medium dense, moist) (bedrock residuum)				
696	3								
695	4		4	Sandstone	Brown weathered sandstone bedrock (Chuckanut formation)				
694				Sandstone	Brown sandstone bedrock (hard, moist)				

Test pit terminated at approximately 4½ feet due to practical refusal on bedrock

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot. Coordinates Data Source: Horizontal approximated based on Topographic Survey. Vertical approximated based on Topographic Survey.





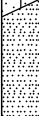
Log of Test Pit TP-3



Project: LWWSD Division 7 Reservoir Seismic Upgrade
Project Location: Bellingham, Washington
Project Number: 0430-014-00

Figure A-4
Sheet 1 of 1

Date Excavated	2/17/2022	Total Depth (ft)	7	Logged By	AF2	Excavator			Groundwater not observed
				Checked By	AJH	Equipment	Hitachi 85 Tracked Excavator		Caving not observed
Surface Elevation (ft)	699	Easting (X)	1282079	Coordinate System	WA State Plane North				
Vertical Datum	NAVD88	Northing (Y)	627829	Horizontal Datum	NAD83 (feet)				

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
608	1		1		Duff	Dark brown silty fine to coarse sand with gravel and organic matter (roots, needles, wood) (forest duff/topsoil)	13	13	
607	2		2		SM/ML	Rust-brown silty fine to coarse sand with gravel to sandy silt with rootlets (loose to medium dense/medium stiff, moist) (weathered horizon)			
606	3		3		SP-SM	Light brown fine to coarse sand with silt, gravel, occasional cobbles and siltstone fragments (medium dense, moist) (bedrock residuum)			
604	5		4 %F						
603	6		5		Sandstone	Light brown sandstone (hard, moist) (Chuckanut formation)			

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot. Coordinates Data Source: Horizontal approximated based on Topographic Survey. Vertical approximated based on Topographic Survey.

Log of Test Pit TP-4



Project: LWWSD Division 7 Reservoir Seismic Upgrade
Project Location: Bellingham, Washington
Project Number: 0430-014-00

Figure A-5
Sheet 1 of 1

Date Excavated	2/17/2022	Total Depth (ft)	4.5	Logged By	AF2	Excavator		Groundwater not observed
				Checked By	AJH	Equipment	Hitachi 85 Tracked Excavator	Caving not observed
Surface Elevation (ft)	701	Easting (X)	1282073	Coordinate System	WA State Plane North			
Vertical Datum	NAVD88	Northing (Y)	627859	Horizontal Datum	NAD83 (feet)			

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
700	1	1			Duff	Dark brown silty fine to coarse sand with gravel and organic matter (forest duff/topsoil) (loose, moist)			
699	2	2			SM	Brown with iron staining and rust-brown silty fine to medium sand with gravel and rootlets (loose, moist) (weathered horizon)			
698	3	3			SM	Light brown silty fine to coarse sand with gravel, occasional cobbles and occasional roots (loose to medium dense, moist) (bedrock residuum)			
697	4	4			Sandstone	Brown sandstone (hard, moist) (Chuckanut formation)			

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Topographic Survey. Vertical approximated based on Topographic Survey.

Log of Test Pit TP-5



Project: LWWSD Division 7 Reservoir Seismic Upgrade
Project Location: Bellingham, Washington
Project Number: 0430-014-00

Figure A-6
Sheet 1 of 1

APPENDIX B

Report Limitations and Guidelines for Use

APPENDIX B

REPORT LIMITATIONS AND GUIDELINES FOR USE¹

This appendix provides information to help you manage your risks with respect to the use of this report.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of Lake Whatcom Water and Sewer District and their authorized agents. This report may be made available to other members of the design team. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. Our report is prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted geotechnical practices in this area at the time this report was prepared. This report should not be applied for any purpose or project except the one originally contemplated.

A Geotechnical Engineering or Geologic Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed Lake Whatcom Water and Sewer District Division 7 Reservoir Seismic Upgrade project in Bellingham, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site explored, or
- Completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- The function of the proposed structure;
- Elevation, configuration, location, orientation or weight of the proposed structure;
- Composition of the design team; or
- Project ownership.

¹ Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

Most Geotechnical and Geologic Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Geotechnical Engineering Report Recommendations are Not Final

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A Geotechnical Engineering or Geologic Report Could be Subject to Misinterpretation

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

Give Contractors a Complete Report and Guidance

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical, Geologic and Environmental Reports Should Not be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of biological pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of biological pollutants and no conclusions or inferences should be drawn regarding biological pollutants, as they may relate to this project. The term "biological pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If Client desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

APPENDIX F
SUDDEN VALLEY COMMUNITY ASSOCIATION
REVOACABLE ENCROACHMENT PERMIT (DRAFT)

SUDDEN VALLEY COMMUNITY ASSOCIATION

REVOCABLE ENCROACHMENT PERMIT APPLICATION

When properly validated this form constitutes a permit

Job Address		Div/Lot	
Contractor / Property Owner	Mailing Address	Phone	Email
Sub Contractor	Mailing Address	Phone	Email
Description of Work To Be Performed (provide attachments as necessary)			

This permit is subject to the following conditions:

- 1 All work must be performed in accordance with the standard plans and specifications of the Sudden Valley Community Association (SVCA)
- 2 Email notification of the start of site work must be received 3 working days in advance (M-F, 8-4:30), by e-mail, to the Sudden Valley ACC Coordinator and the **South Lake Whatcom Fire District** prior to the start of work that will effect road traffic
SVCA E-mail: accadmin@suddenvalley.com **Phone: (360) 746-8431**
South Whatcom Fire Authority email: rtapel@whatcomes.org
- 3 Where street restrictions or closures will occur, flaggers and signage per Washington codes, must be utilized for the safety of vehicle and pedestrian traffic.
- 4 This permit becomes null and void if work in the ROW (Right Of Way) does not commence within 90 days of the approval date for Utility Companies and 12 months per the new construction time limit (14.7.6).

All work shall be done subject to these additional requirements:

- A Native material must be removed, replaced and compacted in one foot lifts per County Road Standards.
- B Ditches shall be restored and re-vegetated to original or better condition unless otherwise approved by the SVCA Maintenance Manager.
- C All road cuts & windows shall be saw cut only.
- D Temporary hard surface (cold mix) or hot patch must be installed the same day work is complete unless otherwise authorized
- E Temporary hard surfaces shall be replaced with permanent hard surface before October 1 of the year this permit is issued
- F Final surface overlay must be completed within the scope of the project prior to final inspection.
- G Notify the SVCA Maintenance Manager at the completion of the site work for a final inspection.
E-mail: bruce@suddenvalley.com **Phone number: (360) 778-2223**
- H Other Requirements and Information:

NO road closures or restrictions will be authorized on **Fridays** due to waste management collection.

Required Information from contractor

<input type="checkbox"/> Proof of bond	<input type="checkbox"/> Plans submitted & Checked
<input type="checkbox"/> License number #	<input type="checkbox"/> Permit Fee \$
<input type="checkbox"/> Deposit Required \$	<input type="checkbox"/> Notification of Start Date

See back page for signatures

SUDDEN VALLEY COMMUNITY ASSOCIATION

REVOCABLE ENCROACHMENT PERMIT APPLICATION

☐ Permission is hereby given to perform the work described in this request, according to the conditions hereon and subject to compliance with SVCA ROW & Road standards.

Approved for issuance by

Title

Date

When form is complete send to accadmin@suddenvalley.com. For questions regarding application contact ACC Coordinator at 360-746-8431.

NOTICE:

I hereby certify that I have read and examined this application and know the same to be true and correct. All provisions of laws and ordinances governing this type of work will be complied with whether specified herein or not. The granting of a permit does not presume to give authority to violate or cancel the provisions of any other state or local law regulating construction or performance of construction. Further, I hereby certify that I am or have hired a licensed contractor to do the work and that said license is in full force and effect, OR that I am the legal owner of the above described real property.

Signature of contractor or Authorized Agent

Date

Signature of Owner

Date

NOTES - LISTED ATTACHEMENTS

SUDDEN VALLEY COMMUNITY ASSOCIATION

REVOCABLE ENCROACHMENT PERMIT APPLICATION

PART 5

DRAWINGS

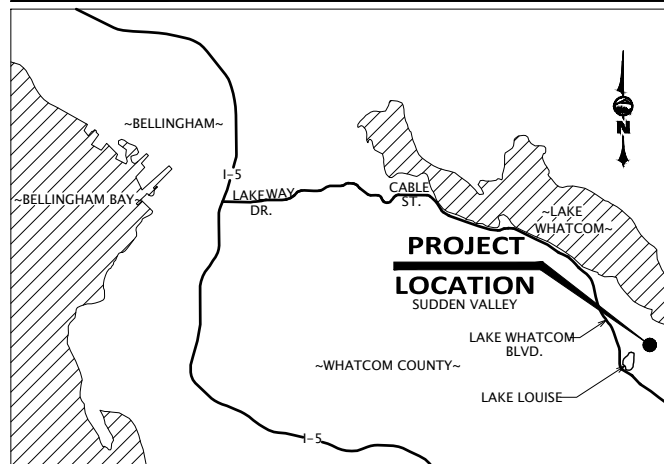
LAKE WHATCOM WATER AND SEWER DISTRICT (PROJECT #C2111)

DIVISION 7 RESERVOIR REPLACEMENT PROJECT

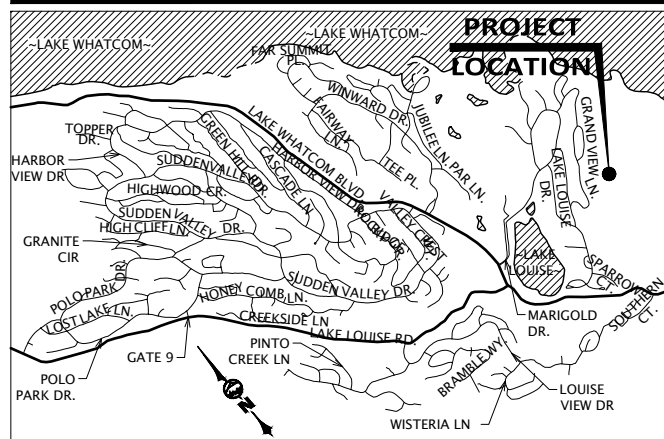
THIS PROJECT IS FUNDED IN PART BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) AND WASHINGTON STATE EMERGENCY MANAGEMENT DIVISION (WA-EMD) THROUGH THE HAZARD MITIGATION ASSISTANCE PROGRAM.

FEMA SUBGRANT NUMBER: 4309-18.

VICINITY MAP - NOT TO SCALE



AREA MAP - NOT TO SCALE



CONTACT INFORMATION

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STEVE.TEVELDE@K-ENGINEERS.COM
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JAMESC@QUALITY-CONTROLS.COM
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PROJECT OWNER
LAKE WHATCOM WATER & SEWER DISTRICT
1220 LAKEWAY DRIVE
BELLINGHAM, WA 98229
JUSTIN CLARY, PE
JUSTIN.CLARY@LWWSO.ORG
PHONE 360-734-9224

INDEX TO DRAWINGS

CIVIL DRAWINGS

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3	C0.3	GENERAL, WATER, AND SEWER NOTES
4	C0.4	W.A.C. 332-130 COMPLIANCE SHEET
5	C1.1	EXISTING CONDITIONS
6	C2.1	DEMO, TREE REMOVAL AND SWPPP PLAN
7	C2.2	SWPPP NOTES
8	C2.3	SWPPP DETAILS
9	C3.1	ACCESS, STAGING AND STOCKPILING PLAN
10	C4.1	OVERALL SITE PLAN
11	C4.2	RESERVOIR PROFILES
12	C4.3	RESERVOIR, WATER, OVERFLOW AND DRAIN PIPE PLAN
13	C4.4	WATER RESERVOIR SITE PLAN
14	C4.5	WATER VAULTS – PLANS AND SECTIONS
15	C4.6	WATER, OVERFLOW AND DRAIN PROFILE
16	C4.7	GRADING AND DRAINAGE PLAN
17	C4.8	STORMWATER PLAN & PROFILE AND RESERVOIR SITE PLAN DETAIL
18	C4.9	RESTORATION PLAN
19	C5.1	WATER DETAILS
20	C5.2	WATER DETAILS
21	C5.3	OVERFLOW, DRAIN AND SEWER DETAILS
22	C5.4	STORMWATER DETAILS
23	C5.5	GENERAL MISC. DETAILS
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25	C6.1	RESERVOIR FLOOR PLAN
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27	C6.3	RESERVOIR ELEVATION AND DETAILS
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33	C6.9	BAKER SILO STRUCTURAL PLANS – 1
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36	E1.2	ELECTRICAL – PARTIAL TANKS SITE PLAN
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38	E6.1	ELECTRICAL – RISER DIAGRAM & LIGHTING & PANEL SCHEDULES

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NUMBER	SHEET NUMBER	SHEET TITLE
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40	D-01	BILL OF MATERIALS
41	D-02	BILL OF MATERIALS
42	D-03	BILL OF MATERIALS
43	D-04	BILL OF MATERIALS
44	P-00	TELEMETRY PANEL – PANEL LAYOUT DIAGRAM
45	N-00	NETWORK DIAGRAM – COMMUNICATIONS LAYOUT
46	C-00	TELEMETRY PANEL, POWER DISTRIBUTION – CONTROL WIRING DIAGRAM
47	C-01	TELEMETRY PANEL, PLC DIGITAL INPUTS – CONTROL WIRING DIAGRAM
48	C-02	TELEMETRY PANEL, PLC DIGITAL OUTPUTS – CONTROL WIRING DIAGRAM
49	C-03	TELEMETRY PANEL, PLC ANALOG INPUTS – CONTROL WIRING DIAGRAM
50	C-04	TELEMETRY PANEL, PLC ANALOG OUTPUTS – CONTROL WIRING DIAGRAM



CDS	DRAWN BY EJH/LMH	CHECKED BY MMM
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LAKE WHATCOM WATER AND SEWER DISTRICT

WHATCOM COUNTY WASHINGTON

DIVISION 7 RESERVOIR REPLACEMENT PROJECT

COVER SHEET

C0.1	PAGE	1 OF 50
	SCALE	AS SHOWN
10-11-2023	JOB NUMBER	2021-130



BID DOCUMENTS

LEGEND & ABBREVIATIONS- SIZE & SCALE MAY VARY	
EXISTING HATCH PATTERNS	DESCRIPTION
	EXIST. CONCRETE
	EXIST. BUILDING
	EXIST. EARTH
	EXIST. GRAVEL
	EXIST. SAND
PROPOSED HATCH PATTERNS	DESCRIPTION
	PROP. CONCRETE
	PROP. TOP COURSE GRAVEL
	PROP. GRAVEL
	PROP. SAND
	PROP. QUARRY SPALLS
	WETLAND HATCH
SURFACE FEATURES	
EXISTING PLAN LINETYPES	DESCRIPTION
	BRIDGE
	BUILDING LINE
	BUILDING COLUMN
	BUILDING OVERHANG
	BULKHEAD
	CONCRETE EDGE
	CREEK EDGE
	CROWN OF ROAD
	CURB
	DITCH CENTERLINE
	DECK
	DOCK
	EDGE OF SAWCUT
	EDGE OF PAVEMENT
	FENCE
	GATE
	GRADE
	GRAVEL
	GUARDRAIL
	JERSEY BARRIER
	LAKE/POND WATER EDGE
	LIP OF CURB
	MISC SURFACE FEATURE
	MISC TRAFFIC
	PLANTER
	PATH
	RAILROAD
	RAMP (WOOD)
	HANDRAIL
	RETAINING WALL
	ROAD STRIPING
	ROCKERY
	RIVERBANK/SHORELINE
	THALWEG LINE
	TOP OF BANK/SLOPE
	TOE OF BANK/SLOPE
	VEGETATION/SHRUB LINE
	WETLAND/SWAMP PERIMETER
	WETLAND BUFFER
SURFACE FEATURES	
PROPOSED PLAN LINETYPES	DESCRIPTION
	BRIDGE
	BUILDING LINE
	CONCRETE
	CURB
	DITCH CENTERLINE
	EDGE OF BIKE LANE
	EDGE OF PAVEMENT
	FENCE
	GATE
	GRAVEL
	GUARDRAIL
	JERSEY BARRIER
	LIP OF CURB
	REBAR
	RETAINING WALL
	ROCKERY
	ROAD STRIPING
	HANDRAIL
	EDGE OF SAWCUT

UTILITIES	
EXISTING PLAN LINETYPES	DESCRIPTION
	CABLE TELEVISION (AERIAL)
	CABLE TELEVISION (BURIED)
	SURVEILLANCE CAMERA (BURIED)
	FIBER OPTIC/COMMUNICATIONS LINE (AERIAL)
	FIBER OPTIC/COMMUNICATIONS LINE (BURIED)
	TELEPHONE/COMMUNICATIONS (AERIAL)
	TELEPHONE/COMMUNICATIONS (BURIED)
	TRAFFIC SIGNAL CONDUIT LINE
	POWER (AERIAL)
	POWER (BURIED)
	UTILITY (AERIAL)
	UTILITY (BURIED)
	POWER DUCT BANK (BURIED)
	DRAIN FIELD
	SANITARY SEWER
	APPROXIMATE SANITARY SEWER
	SANITARY SEWER (FORCE MAIN)
	APPROXIMATE SANITARY SEWER (FORCE MAIN)
	STORM DRAINAGE
	APPROXIMATE STORM DRAINAGE
	CULVERT (Ø WIDTH)
	CULVERT
	RECLAIMED WATER
	IRRIGATION
	WATER
	APPROXIMATE WATER
	8" WATER
	OVERFLOW
	STEAM
	GAS
	GAS TANK/STRUCTURE
	OIL
	AIR LINE
	BURIED UTILITY APPROX. EXTENTS
	MISC UTILITY (BURIED)
PROPOSED PLAN UTILITY LINETYPES	DESCRIPTION
	WATER
	8" WATER
	IRRIGATION
	RECLAIMED WATER
	POTABLE WATER
	WATER SERVICE
	WATER STRUCTURE
	FIRE DEPARTMENT CONNECTION
	FIRE PROTECTION LINE
SANITARY SEWER	
	SEWER
	8" SEWER
	FORCE MAIN
	DRAIN FIELD
	SEWER SERVICE
	SEWER STRUCTURE
STORM DRAIN	
	STORM DRAIN
	STORM DRAIN
	STORM DRAIN
	STORM SERVICE
	FOOTING DRAIN
	STORM STRUCTURE
MISC. UTILITIES	
	GAS
	POWER
	TELEPHONE/COMMUNICATIONS
EROSION CONTROL	
	EROSION TRIANGULAR SILT DIKE
	EROSION CONTROL COMPOST BERM
	EROSION CONTROL MINOR CONTOUR
	EROSION CONTROL MAJOR CONTOUR
	ORANGE BARRIER FENCE
	SILT FENCE
	STRAW WATTLE
	EROSION CONTROL FLOWLINE
	STRAW BALE
	INLET PROTECTION
	CHECK DAM

SURVEY	
PLAN LINETYPES	DESCRIPTION
	CENTERLINE (EXISTING)
	CENTERLINE (CONSTRUCTION)
	CENTERLINE (PROPOSED)
	CONTOUR (EXISTING MINOR)
	CONTOUR (EXISTING INDEX)
	HYDRO CONTOUR (EXISTING INDEX)
	CONTOUR (PROPOSED INDEX)
	CONTOUR (PROPOSED MINOR)
	DONATION LAND CLAIM (EXIST.)
	EASEMENT (PROPOSED)
	EASEMENT (EXISTING)
	MEANDER LINE
	ORDINARY HIGH WATER LINE
	MEAN LOW LEVEL WATER LINE
	OWNERSHIP LINE
	PROPERTY LINE (RECORD OR ADJACENT)
	PROPERTY LINE
	QUARTER SECTION LINE
	RANGE/TOWNSHIP LINE
	RESERVATION/PARK/FOREST (EX)
	RIGHT-OF-WAY (EXISTING)
	RIGHT-OF-WAY (EXISTING USED)
	RIGHT-OF-WAY (PROPOSED)
	RIGHT-OF-WAY (EX. RECORD) (RECORD OR ADJACENT)
	RIGHT-OF-WAY (LIMITED ACCESS)
	RIGHT-OF-WAY (LIMITED ACCESS)
	SECTION LINE
	SETBACK LINE (EXISTING)
	SIXTEENTH SECTION LINE
	STATE/COUNTY/CORPORATE LIMIT
	VACATED RIGHT-OF-WAY
	EASEMENT (RECORD)
	RIGHT-OF-WAY CENTER (RECORD)
	DONATION LAND CLAIM (RECORD)
	MEANDER LINE (RECORD)
	PARK LINE (RECORD)
	SECTION LINE (RECORD)
	QUARTER SECTION LINE (RECORD)
	SIXTEENTH SECTION LINE (RECORD)
	STATE LINE (RECORD)
	RANGE LINE (RECORD)
PROFILE LINETYPES	DESCRIPTION
	PROFILE EX. GRND
	PROFILE FINISH GRND
	PROFILE GRID
	PROFILE VERTICAL GRID
	PROFILE EX. GROUND LEFT
	PROFILE EXISTING GROUND RIGHT
	FIBER OPTIC PROFILE (EXISTING)
	GAS PROFILE (EXISTING)
	POWER PROFILE (EXISTING)
	RAILROAD PROFILE (EXISTING)
	SANITARY PROFILE (EXISTING)
	SANITARY PROFILE (PROPOSED)
	STORM PROFILE (EXISTING)
	TELEPHONE PROFILE (EXISTING)
	STORM PROFILE (PROPOSED)
	TV PROFILE (EXISTING)
	UTILITY PROFILE (EXISTING)
	WATER PROFILE (EXISTING)
	WATER PROFILE (PROPOSED)
DEMOLITION	
	SURFACE FEATURE OR UTILITY TO BE REMOVED
	SAWCUT
	CLEARING LIMIT
	TREE OR BUSH TO BE REMOVED
GRADING	
	GRADE BREAK
	CATCHLINE
	CUT LINE
	FILL LINE
	SLOPE ARROWS
SECTION/DETAIL CALL-OUTS	
	SECTION CALL-OUTS: (A) REPRESENTS THE SECTION LABEL, (B) INDICATES THE SHEET ON WHICH THE SECTION APPEARS.
	DETAIL CALL-OUTS: (A) REPRESENTS THE DETAIL LABEL, (B) INDICATES THE SHEET ON WHICH THE DETAIL APPEARS.

MISC. SYMBOLS		
EXISTING	PROPOSED	DESCRIPTION
		SOIL BORING
		MONITORING WELL
		TEST WELL
		TEST PIT
		EMBANKMENT
		MAIL BOX
		SIGN
		RIP RAP
		BOULDER
		MEANDER LINE
		SHRUB
		TREE (Conifer)*
		TREE (Deciduous)*
		STUMP-PLAN VIEW
		YARD LIGHT
		WELL
		PILE
		ROCKERY
		WHEEL STOP
		SPLASH BLOCK
		GAS METER
		GAS VALVE
		PAD MOUNTED TRANSFORMER
		POWER VAULT
		TRANSMISSION TOWER
		POWER CABINET OR PANEL
		POWER METER
		GUY POLE
		UTILITY POLE
		UTILITY POLE ANCHOR
		TELE RISER
		CABLE RISER
		FIBER OPTIC RISER
		FIBER OPTIC MANHOLE
		TELEPHONE MANHOLE
		STEAM MANHOLE
		PARKING METER
		POST
		PUMP
SANITARY SEWER SYMBOLS		
EXISTING	PROPOSED	DESCRIPTION
		SAN. SEWER CLEAN OUT
		SAN. SEWER MANHOLE
STORM DRAIN SYMBOLS		
EXISTING	PROPOSED	DESCRIPTION
		STORM DRAIN CB TYPE 1
		STORM DRAIN CB TYPE 2
		STORM DRAIN CB TYPE 2 W/CB LID
		STORM DRAIN WITH OVERFLOW GRATE
		STORM DRAIN CLEAN-OUT
		STORM DOWNSPOUTS
PIPE CALL-OUT		
		PIPE CALL-OUTS: (A) REPRESENTS THE PIPE SIZE IN INCHES, (B) INDICATES THE UTILITY TYPE (C) REPRESENTS THE PIPE LENGTH IN LINEAL FEET
SYMBOLS		SPOT ELEVATIONS
=DEGREES =PLUS/MINUS =DIAMETER =DELTA =CENTERLINE =FLOWLINE =PROPERTY LINE		 ① = ELEVATION ② = DESCRIPTION- SEE DEFINED ABBREVIATIONS ABOVE
		SECTION SHEET LABELS: (A) REPRESENTS THE SHEET ON WHICH THE SHEET BEGINS (B) INDICATES THE SHEET ON WHICH THE SHEET ENDS
		DETAIL SHEET LABELS: (A) REPRESENTS THE SHEET(S) ON WHICH THE SHEET BEGINS (B) INDICATES THE SHEET(S) ON WHICH THE SHEET ENDS
CX.XC (B)		

WATER SYMBOLS		
EXISTING	PROPOSED	DESCRIPTION
		ARV VALVE
		GLOBE VALVE, FL
		BALL CHECK VALVE, FL
		BLOW-OFF VALVE
		SWING CHECK VALVE, FL
		BUTTERFLY VALVE, FL
		HOSE BIB/SPIGOT
		DOUBLE LEAF CHECK VALVE
		PLUG VALVE
		BALL VALVE
		FLOAT VALVE
		PINCH VALVE
		PRESSURE & VACUUM RELIEF VALVE
		PRESSURE REGULATING VALVE (SELF CONTAINED)
		BACK PRESSURE REGULATING VALVE (SELF CONTAINED)
		IN-LINE SPRING LOADED RELIEF VALVE
		CAP/PLUG
		GUARD POST/BOLLARD
		THRUST BLOCK
		WATER METER
		FIRE DEPARTMENT CONNECTION
		WATER VALVE
		FIRE HYDRANT
		WATER MANHOLE
		POST INDICATOR VALVE
		11-1/4 BEND, MJ-FL
		22-1/2 BEND, MJ-FL
		45 BEND, MJ-FL
		90 BEND, MJ-FL
		FLXMJ ADAPTER
		COUPLER
		BLIND FLANGE
		GATE VALVE, FLxMJ
		GATE VALVE, MJ
		REDUCER, MJxFL
		REDUCER, MJ
		TEE, FL
		TEE, MJ
		TEE, MJxFL
		TEE, FLxMJ
		CROSS, FL
		CROSS, MJ
SURVEY SYMBOLS		
		BRASS SURFACE MONUMENT
		CONCRETE MONUMENT
		FOUND REBAR
		SET REBAR
		MONUMENT IN CASE
		TRAVERSE POINT
<div>NOTE TO USER: CONTENT SHOWN ON THIS PAGE IS SUBJECT TO CHANGE AND MAY DIFFER THROUGHOUT THE PLAN SET.</div>		

) REPRESENTS THE PIPE SIZE IN INCHES,
UTILITY TYPE (C) REPRESENTS THE PIPE
FEET

DIRECTIONAL ABBREVIATIONS

N	=NORTH
NE	=NORTHEAST
E	=EAST
SE	=SOUTHEAST
S	=SOUTH
SW	=SOUTHWEST
W	=WEST
NW	=NORTHWEST


IONS ABOVE


THE SECTION LABEL, (B)
SECTION IS CALLED OUT.


THE DETAIL LABEL, (B)
DETAIL IS CALLED OUT.


ABBREVIATIONS	
AB	=AS-BUILT (RECORD)
AC	=ASBESTOS CEMENT
AL	=ALIGNMENT
ANK	=UTILITY POLE ANCHOR
APPROX	=APPROXIMATE
ASPH or AC	=ASPHALT
ASSY	=ASSEMBLY
ASTM	=AMERICAN SOCIETY FOR TESTING & MATERIALS
BLDG	=BUILDING
BMP	=BEST MANAGEMENT PRACTICE
BVCS	=BEGIN VERTICAL CURVE STATION
BVCE	=BEGIN VERTICAL CURVE ELEVATION
CB	=CATCH BASIN
CK	=CHECK VALVE
C/L	=CENTERLINE
CESCL	=CERTIFIED EROSION SEDIMENT CONTROL LEAD
COL	=COLUMN
CMP	=CORRUGATED METAL PIPE
CMU	=CONCRETE MASONRY UNIT
C.O. or CO	=CLEAN OUT
CONC. C	=CONCRETE
COR	=CORNER
CRSI	=CONCRETE REINFORCING STEEL INSTITUTE
CPP	=CORRUGATED POLYETHYLENE PIPE
CSBC	=CRUSHED SURFACING BASE COURSE
CSTC	=CRUSHED SURFACING


PLOT SETTINGS: RICH 8X11-- B&W.pc3, Letter, Portrait, 1:1.05, WE, APWA_UNSCREENED.ctb
W:\2021\2021-130 LWSD DIV 7 TANK.DWG\2019_2021-130 CO.3 GENERAL NOTES.DWG - 10/26/2023 12:17 PM - Benton Secy


GENERAL NOTES	
<p>1. All work and materials shall meet the requirements of the most current editions of the Lake Whatcom Water and Sewer District (District) Design and Construction Standards, Lake Whatcom Water and Sewer District Construction Contract Documents and Project Specifications (for Public Works Projects), the instructions and recommendations of the Manufacturer of the material concerned, and select specifications within the Standard Specifications for Road, Bridge and Municipal Construction as prepared by Washington State Department of Transportation (WSDOT) and with all other regulatory agency requirements and permits including but not limited to work within Whatcom County right-of-way shall meet Whatcom County (County) design and construction requirements. In case of a conflict between the above standards, the more stringent shall apply. All work and materials shall be subject to the approval of the District Engineer.</p> <p>2. Contractor shall obtain encroachment permits or other permissions which may be required from the County, Sudden Valley Community Association, or other entity having jurisdiction over roads and streets, prior to commencing work.</p> <p>3. Contractor shall provide and maintain all Temporary Erosion Control and Sedimentation (TESC) in accordance with the most current edition of the Storm Water Management Manual for Western Washington (SWMWW), Volume II, by the Washington State Department of Ecology, Publication Number 14--10--055. Contractor shall use required and necessary Best Management Practices (BMPs) described therein and as may be further described or detailed on the project drawings.</p> <p>4. Contractor shall call 1-800-424-5555 48 hours before construction for utility locations. Contractor shall not begin excavation until utility notification period is complete.</p> <p>5. A preconstruction meeting is required with the District and Contractor performing the work a minimum of 2-days before the start of construction.</p> <p>6. Authority of Engineer, its appointees, assistants and inspectors, shall be per WSDOT 1-05.1. All references to the Engineer or District Engineer shall also mean its appointees, assistants and inspectors as per WSDOT 1-05.2.</p> <p>7. The Contractor shall be responsible for the safety of all workers and shall comply with all appropriate state safety and health standards, codes, rules, and regulations, including, but not limited to, those promulgated under the Washington Industry Safety and Health Act RCW 49.17 (WISHA) and as set forth in Title 296 WAC (Department of Labor and Industries). In particular the Contractor's attention is drawn to the requirements of WAC 296.800 which requires employers to provide a safe and healthful workplace.</p> <p>8. Inspection of work and materials shall be in accordance with WSDOT 1-05.6. Removal of unauthorized or defective work shall be in accordance with WSDOT 1-05.7.</p> <p>9. The Contractor shall take all steps necessary to ensure that the existing facilities remain fully operational during all stages of construction, including but not limited to providing bypass pumping, standby storage, emergency generators and pump trucks, as necessary during service interruptions or outages.</p> <p>10. No inspections or tie-ins to District's facilities shall be performed on a Friday, Weekend or District Holiday.</p>	
	STANDARD DETAIL G1 3/11/2020


the rate of disposal does not overload the District's sewer system.	
<p>10. New services shall be pressure tested along with the new main. No use of water through a newly installed service shall be allowed until water main and service installation has been inspected, pressure tested, chlorinated and a satisfactory bacteria test received. After installation, the service connection shall be flushed prior to connecting the meter. No service is to be covered until the District's Inspector has inspected the initial installation. All corporations must be in an ON position and all angle valves must be in the OFF position.</p> <p>11. Service flow testing shall be done after water main pressure testing. During the inspection, every service shall be turned on to its full capacity to check flow and guarantee that each service line has been flushed.</p> <p>12. Water service lines on the customer side of the water meter shall meet the requirements of the Uniform Plumbing Code (UPC).</p> <p>13. In accordance with District Administrative Code Section 4.3.6, all customers are required to install a Pressure Reducing Valve (PRV) downstream of the meter and dual check valve on the customer side of service to protect their plumbing systems from high pressure surges. A PRV inspection by District personnel is required prior to occupancy. See detail W11.</p> <p>14. In accordance with WAC 246-290-490 and District Resolution No. 858, all cross-connections between the District's water distribution system and a consumer's water system shall be eliminated or controlled by the installation of a District approved backflow preventer commensurate with the degree of hazard. The District's Cross-Connection Control Program is available for review at the District office or on the District website (www.lwbsd.org).</p>	
	STANDARD DETAIL W2 3/11/2020

11. All pipe shall be bedded in bedding material meeting the requirements of WSDOT 9-03.12(3). The bedding cross-section shall be blocked with Control Density Fill (CDF) per WSDOT 2-09.3(1)E a minimum of every 800 feet and the trench drained to daylight or to a storm drain in accordance with District Standard Detail G11.	
12. Backfill above the pipe zone bedding within County ROW, within the roadway section or at driveway crossings shall consist of crushed surfacing top course material meeting the requirements of WSDOT 9-03.9(3). Backfill within private roadways shall consist of material meeting the requirements of WSDOT 9-03.19. Backfill in other areas shall consist of material meeting the requirements of WSDOT 9-03.15, except as shown on the plans or details. Backfilling of trenches shall be in accordance with WSDOT 7.08.3(3).	
13. Pea gravel shall not be used for pipe bedding or trench/excavation backfill material. The District may approve limited use of pea gravel where hazardous site conditions exist that pose an immediate threat to workers or public. Pea gravel, if approved for use by the Engineer, shall be a clean mixture free from organic matter meeting the following gradation (passing by weight a US standard sieve); 100% passing 1/2", 95-100% passing 3/8", 0-10% passing #8, and 0-3% passing #200.	
14. Backfill shall be compacted to minimum 95% modified Proctor within traffic areas and minimum 90% modified Proctor in landscape and open areas.	
15. Tracer wire installation is required on all District owned pipe, electrical conduits and communication lines/conduits. Tracer wire is also required on private side sewers. Install tracer wire per District Standard Detail E6. In addition to tracer wire, install 2-inch wide detectable marking tape 8 to 12 inches below the finish surface. Detectable marking tape shall meet the requirements of WSDOT 9-15.18 and be color coded blue for water, green for sewer, red for electrical and orange for telecommunication.	
16. Public water lines and any sanitary sewer line or other non-potable conveyance system shall maintain a minimum of 10-foot horizontal separation (parallel alignment) and a minimum 18-inch vertical separation (parallel alignment and crossings at angles including perpendicular with the sewer line below the water line), measured as the closest distance between outside of pipes, in accordance with the most current editions of the Washington State Department of Health (DOH) Water System Design Manual Section 8.4.4 and the Department of Ecology (DOE) "Criteria for Sewage Works Design" Section C1-9.	
When local conditions prevent these separations, with the approval of the District Engineer, installations shall follow the requirements outlined for unusual conditions in the referenced DOH and DOE manuals which includes details for specific pipe materials, pipe segment lengths, joint separation requirements, concrete encasement and/or pipe casings. If a pressure sewer cannot be installed with a minimum 18-inch separation from a water line at a crossing, then the pressure sewer shall be constructed only under the water line with ductile iron pipe or standard sewer pipe in a casing (casing material per the DOE manual) extending at least 10-feet on each side of the crossing.	
17. Control Density Fill (CDF), if required, shall meet the requirements of WSDOT 2-09.3(1)E.	
18. From the main to the property line, sewer pipes and water pipes shall maintain a minimum horizontal separation of 10-feet. When local conditions prevent the 10-foot separation, separation shall be per District Standard Detail G10, Water Line and Sewer Line Trench Detail, Unusual Conditions. Separation of water service lines and sewer pipes within private property shall be per District Standard Detail G9.	
	STANDARD DETAIL G2 3/11/2020

SEWER SYSTEM NOTES:	
<p>1. Sewer system materials, trenching, bedding, installation, backfilling, and testing shall meet the requirements of WSDOT 7-05 and WSDOT 7-17 and District standards detailed herein.</p> <p>2. Gravity sewer pipe shall be ASTM D3034-SDR 35 PVC per WSDOT 9-05.12(1). In certain applications, the District may require class 52 ductile iron pipe, per WSDOT 9-30.1(1), encased in polyethylene encasement per WSDOT 9-30.1(2).</p> <p>3. Pressure sewer pipe shall be class 52 ductile iron pipe per WSDOT 9-30.1(1) encased in polyethylene encasement per WSDOT 9-30.1(2) or PVC C900 class 150 per WSDOT 9-30.1(5). HDPE may be substituted with the approval of the District Engineer (pipe rating, resins, physical properties, dimensions and tolerances must be as specified in the American Water Works Association (AWWA) Manual C901 for the specific design conditions).</p> <p>4. Sewer service lines from the public sewer main to the cleanout adjacent to the building must be installed by a contractor on the District's current Bonded Side Sewer Contractor list.</p> <p>5. All sewer system installations shall be inspected prior to backfill.</p> <p>6. All gate valves for sewer force mains shall have a cast iron valve box with a commercial concrete collar (18" x 18" x 6") with each valve. Valves not in pavement shall have a 24" x 24" x 6" concrete collar cast around the valve box.</p> <p>7. Side sewers, from main to private property line, shall meet the requirements of WSDOT 7-18. Side sewers shall have a minimum slope of 2%. Side sewers shall maintain a minimum cover of 36-inches and 30 inches under ditches. Side sewers and cleanout/test tee at property line shall be minimum 6-inches in diameter.</p> <p>8. Side sewers within private property shall meet the requirements of the District Standards detailed herein. Gravity side sewers shall have a minimum slope of 2%. Minimum size for gravity sewer lines will be 4-inches for a single family residence and 6-inches for a multi-family residence up to a 4-plex. See Standard Detail S10 for requirements regarding layout (bends) and cleanouts. Sewer cleanouts shall be installed per WSDOT 7-19.</p> <p>9. Grout for manholes shall be a non-shrinking cementitious grout, containing no gypsum or calcium sulfate Di-hydrate (CaSO42H2O), conforming to WSDOT 9-20.3(2), such as Rapid Set Cement All or approved equivalent. Grout shall be installed according to manufacturer's instructions. JET SET, BLUELINE, AND QUICKCRETE ARE NOT ALLOWED.</p> <p>10. All sewer pipe and appurtenances shall be flushed and cleaned prior to being put into service. Debris shall not be allowed into the existing sewer system.</p>	
	STANDARD DETAIL S1 3/11/2020

19. Contractor shall remove all debris and excess excavation; repair all damage, and restore the site, public or private, to pre-construction conditions.	
20. Where mains or service lines are placed within a ditch area, the buried depth shall be at least 30-inches below the bottom of the ditch, measured from the crown of the pipe to the bottom of the ditch.	
21. All work within Whatcom County Right Of Way (ROW) shall meet the requirements of the most current edition of the Whatcom County Development Standards, Section 512.	
22. The Lake Whatcom Water and Sewer District is located within the Lake Whatcom Watershed where seasonal clearing activity limitations established by Whatcom County Code 20.51.410 are in force. Clearing activity, which includes trench excavation/backfill and other land disturbance, that will result in exposed soils exceeding 500 square feet are not permitted from October 1 through May 31.	
23. References to the Uniform Plumbing Code (UPC) shall be to the edition, amendments standards and exemptions adopted by Whatcom County, as detailed in the most current edition of the Whatcom County Code, Chapter 15.04, Building Codes.	
	STANDARD DETAIL G3 3/11/2020

11. The District Engineer shall witness testing. Contractor shall provide the District Engineer 48-hours notice prior to conducting tests or sampling.	
12. Pipe shall be tested after backfill by the low-pressure air test method per WSDOT 7-17.3(2)F. PVC pipe shall have a mandrel passed through it to check for any deflections in the pipe per WSDOT 7-17.3(2)G. All sewers shall be television inspected and video delivered to the District, with all costs borne by Contractor, before acceptance. Connection to the existing system is not permitted until final acceptance.	
13. Side sewers on private property shall be cleaned and tested by either a low pressure air test or exfiltration water test at the option of the Contractor, as per WSDOT 7-17.3(2)A. Water testing shall follow WSDOT 7-17.3(2)B. As stated therein, leakage shall be no more than 0.28 gph per inch diameter per 100 feet of sewer, with a hydrostatic head of 6 feet above the crown at the upper end of the test section, or above the natural ground water table at the time of test, whichever is higher. The length of pipe tested shall be limited so that the pressure at the lower end of the Section tested does not exceed 16 feet of head above the invert.	
Where the test head is other than 6 feet, the maximum leakage shall not exceed the amount determined from the following equation: $\text{Maximum leakage (in gallons per hour)} = 0.28 \times (\sqrt{H}/\sqrt{6}) \times D \times (L/100)$ Where: D = diameter (in.) L = length of pipe (ft.) H = test head (ft.)	
Air testing may be done in lieu of a water test. An air test is acceptable when air is slowly supplied to the plugged pipe section until the internal air pressure reaches 4 psi and maintains for 5 minutes with no pressure loss.	
14. Downspouts, foundation/crawl space sump pumps, yard drains, or any outside drains shall not be connected to sanitary sewer mains or services.	
15. Contractor shall prepare Record Drawings of all new sanitary sewer main/lateral construction in accordance with Lake Whatcom Water and Sewer District Design Standards Section 1.2.1 (Record Drawings) and Standard Detail G-6.	
	STANDARD DETAIL S2 2/23/2022

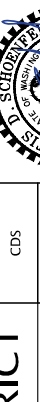

WATER SYSTEM NOTES	
<p>1. Water distribution system materials, trenching, bedding, installation, backfilling, disinfection, and testing shall meet the requirements of WSDOT 7-09.</p> <p>2. All water piping and appurtenances in contact with potable water shall be certified under NSF-61 for potable water use in accordance with WAC 246-290-220.</p> <p>3. Water main pipe shall be class 52 ductile iron per WSDOT 9-30.1(1) and encased in polyethylene encasement per WSDOT 9-30.1(2). Fittings for ductile iron pipe shall meet the requirements of WSDOT 9-30.2 (1).</p> <p>4. Water Main Appurtenances. Valves shall have a minimum pressure rating of 200 psi. Gate valve installation shall conform to WSDOT 7-12. Gate valves shall be resilient-seated gate valves conforming to WSDOT 9-30.3(1) and AWWA C515 Standard for Resilient Seated Gate Valves. A cast iron valve box with a commercial concrete collar (18" x 18" x 6") shall be installed with each valve. An approved marking post shall be installed with each valve in accordance with WSDOT 7-12.3(1) for all valves not installed in pavement. Valves not in pavement shall have a 24" x 24" x 6" concrete collar cast around the valve box. Where a valve operating nut is more than 4-feet lower than grade, an American Flow Control Trench Adapter valve box and stem extension combination (or approved equal) must be installed.</p> <p>5. Pressure reducing valves (2" and larger) shall be manufactured by Cla-Val, Watts, or approved alternate.</p> <p>6. Service connections shall be installed per WSDOT 7-15. Lot corners shall be staked prior to service connection installations to assure services are installed in correct locations as shown on the approved plans.</p> <p>7. The District Engineer shall witness pressure testing. Bacteriological sampling shall be conducted by a District certified operator (employee). Contractor shall provide the District Engineer 48-hours notice prior to conducting tests or sampling.</p> <p>8. Water lines and appurtenances shall be pressure tested in accordance with WSDOT 7-09.3(23).</p> <p>9. Before being placed into service, new water mains and repaired portions of, or extensions to, existing mains shall be flushed and disinfected by the Contractor in accordance with WSDOT 7-09.3(24) and the most current edition of the American Water Works Association (AWWA) Standard C651, Disinfecting Water Mains. As stated therein, the District requires two set of samples, either a) taken 16 hours apart or b) two samples are taken 15 minutes apart after a 16 hour rest period, satisfactorily passing bacteriological testing requirements (testing includes but is not limited to testing for total coliforms, fecal coliforms and E.coli found in the water sample) meeting current Washington State Department of Health (DOH) Standards, before connecting the new or repaired portion of main. Costs of bacteriological testing shall be borne by the Contractor. In addition, Contractor shall provide two chlorine concentration test reports to show the initial chlorine concentration is at least 50 mg/L, and to show the 24-hour residual chlorine concentration is at least 25 mg/L. All tests must be performed by a DOH-certified testing laboratory and sample-taking shall be performed by a District certified operator (employee). Bacteriological samples must be collected by the District. Chlorinated flush water must be dechlorinated and disposed of in accordance with WSDOT 7-09.3(24)A. If disposal is to the District's sanitary sewer system, Contractor shall coordinate with District staff to ensure</p>	
	STANDARD DETAIL W1 3/11/2020

MISC NOTES:

1. ALL DEVICES REQUIRING LOCKS, INCLUDING BUT NOT LIMITED TO DOORS, GATES, ACCESS HATCHES, CONVENIENCE HATCHES, ELECTRICAL CONTROL PANELS, TELEMETRY PANELS, ETC., SHALL BE FITTED TO MATCH OWNER'S STANDARD LOCKS AND KEYS. THE OWNER SHALL PROVIDE THE KEY REQUIREMENTS TO THE CONTRACTOR.



BID DOCUMENTS

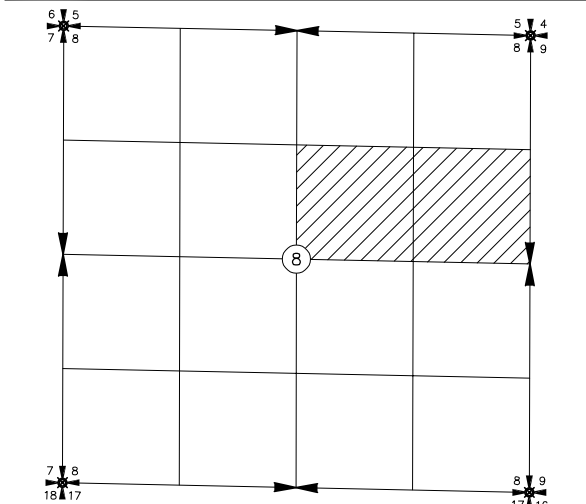
SHEET		C0.3		DATE		10-17-2023		LAKE WHATCOM WATER AND SEWER DISTRICT		DESIGNED BY		CDS		DRAWN BY		EJH/LMH		CHECKED BY		MMM				10-26-2023				WILSONENGINEERING.COM	
PAGE		3		OF		50		DIVISION 7 RESERVOIR REPLACEMENT PROJECT		WASHINGTON																			
								GENERAL, WATER, AND SEWER NOTES		WHATCOM COUNTY																			

LAKE WHATCOM WATER AND SEWER DISTRICT

DIVISION 7 RESERVOIR SEISMIC UPGRADE AND SHAKE ALERT IMPLEMENTATION

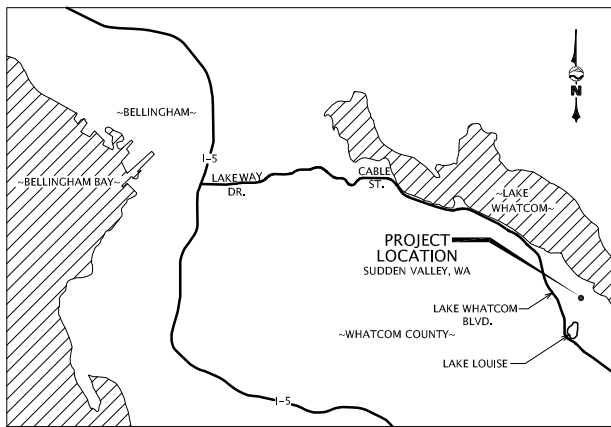
W.A.C. 332-130 COMPLIANCE SHEET

SECTIONAL INDEX DATA

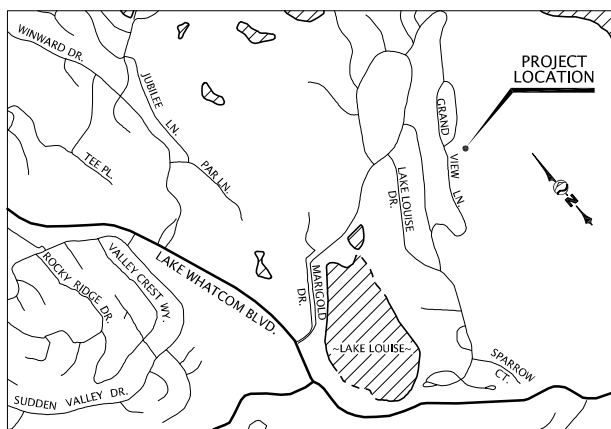


SW QTR - NE QTR, SEC. 8, TOWNSHIP 37 NORTH, R 4 EAST, W.M.
SE QTR - NE QTR, SEC. 8, TOWNSHIP 37 NORTH, R 4 EAST, W.M.

AREA MAP - NOT TO SCALE



VICINITY MAP - NOT TO SCALE



NOTICE TO USER

EFFECTIVE JANUARY 13, 2019, ALL TOPOGRAPHIC MAPS PREPARED BY A LICENSED SURVEYOR IN THE STATE OF WASHINGTON, AND SUBJECT TO THE LICENSURE AND PRACTICE REQUIREMENTS ESTABLISHED BY THE WASHINGTON STATE BOARD OF REGISTRATION FOR ENGINEERS AND LAND SURVEYORS, MUST INCLUDE THE DESCRIPTIVE NOTES AND METADATA ENUMERATED UNDER W.A.C. 332-130-145 AND ITS APPURTENANT SECTIONS OF 332-130. THIS EXHIBIT IS INTENDED TO ADDRESS THE STATUTORY REQUIREMENTS STIPULATED BY THIS W.A.C DIRECTIVE.

W.A.C. 332-130-145 REQUIRED DATA

1.E: THIS SURVEY WAS PREPARED UNDER THE DIRECT SUPERVISION OF:

PAUL J. DARROW, WA PLS #50697
SR. PROJECT SURVEYOR
WILSON ENGINEERING LLC
805 DUPONT STREET, SUITE 7
BELLINGHAM, WA 98225
360-733-6100 (EXT. 1243)
pdarrow@wilsonengineering.com

2.A: BASIS OF ELEVATIONS: ELEVATION VALUES AND CONTOURS DEPICTED ON THIS SURVEY ARE BASED UPON HOLDING AS FIXED THE NAVD88 DATUM, DERIVED FROM NETWORK ADJUSTED VRS RTK OBSERVATIONS BASED UPON THE WASHINGTON STATE REFERENCE NETWORK "NWWA".

2.B: PURPOSE OF SURVEY: WILSON ENGINEERING PERFORMED THIS SURVEY DURING JUNE OF 2021, AT THE REQUEST OF LAKE WHATCOM WATER AND SEWER DISTRICT PURSUANT TO NEW RESERVOIR TANK DESIGN. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT, AND THE DEPICTED PARCEL BOUNDARY SHOULD NOT BE CONSIDERED AUTHORITATIVE.

2.C: SOURCE OF CONTOURS: THE CONTOURS DEPICTED ON THIS SURVEY WERE DERIVED BASED ON FIELD OBSERVATIONS.

2.D: CONTOUR INTERVAL LABELING: CONTOURS AT 1-FOOT INTERVALS HAVE BEEN EXPLICITLY LABELED.

2.E: DESCRIPTION OF BENCHMARKS SET PURSUANT TO THIS SURVEY: REFER TO THE ACCOMPANYING "CONTROL TABLE" FOR COORDINATES, ELEVATION, AND DESCRIPTION OF ON-SITE CONTROL SET PURSUANT TO THIS SURVEY.

2.F: ELEVATION AND/OR CONTOUR ACCURACY: IF CONTOURS HAVE BEEN DEPICTED ON THE FACE OF THIS SURVEY, IT IS ANTICIPATED THAT 90% OF ANY MEASURED ELEVATION VALUE, IF OBSERVED RELATIVE TO THE CONTROL POINTS SPECIFICALLY ENUMERATED IN THE ACCOMPANYING CONTROL TABLE, WILL BE, IN FACT, WITHIN ONE-HALF OF THE MINOR-CONTOUR INTERVAL DEPICTED HEREON. SPECIFIC ELEVATIONS DEPICTED HEREON, IF ANY, ARE EXPECTED TO BE WITHIN ONE INTEGRAL VALUE OF THE FINAL DEPICTED SIGNIFICANT FIGURE. THAT IS, 90% OF ELEVATIONS EXPRESSED TO THE TENTH-FOOT, SHOULD BE WITHIN 0.1 FEET OF THAT VALUE, IF OBSERVED RELATIVE TO THE SURVEY CONTROL SPECIFICALLY ENUMERATED IN THE ACCOMPANYING CONTROL TABLE. IF OFF-SITE CONTROL IS EMPLOYED, EVEN CONTROL PURPORTING TO BE ON THE SAME DATUM OR BASED ON THE SAME OFF-SITE BENCHMARK, THEN NO ABSOLUTE STATEMENT REGARDING THE ACCURACY OF THE DEPICTED POINTS CAN BE MADE, AND VALUES SO OBSERVED ARE OUTSIDE OF THIS SURVEY'S AUTHORITY OR INTEREST.

2.G: STATEMENT OF USE: AS NOTED IN SECTION 2.B, THIS SURVEY WAS PREPARED FOR THE SPECIFIC PURPOSE OF NEW RESERVOIR TANK DESIGN. IN THE COURSE OF PREPARING THIS SURVEY, PURSUANT TO THIS PURPOSE, ANCILLARY DATA NECESSARY TO ACCOMPLISH THIS SURVEYS INTENDED PURPOSE MAY HAVE BEEN CAPTURED. IN THE CASE OF THIS SURVEY, BOUNDARY INFORMATION AND BUILDING ENVELOPES WERE CAPTURED, BUT THE DEPICTION OF SAME SHOULD NOT BE CONSIDERED AUTHORITATIVE.

2.H: SOURCE OF CONTROLLING BOUNDARY INFORMATION: THE OWNERSHIP BOUNDARIES DEPICTED ON THIS SURVEY ARE BASED UPON SOME, OR ALL, OF THE DOCUMENTS ENUMERATED IN THE ACCOMPANYING "REFERENCE DOCUMENTS" AS THEREIN CHARACTERIZED. BEARINGS HAVE BEEN TRANSLATED AND/OR ROTATED FROM THE RECORD VALUES IN ORDER TO CONFORM TO FOUND MONUMENTATION MEASURED IN THIS SURVEY'S COORDINATE SYSTEM.

3.A: SOURCE OF DEPICTED UTILITY INFORMATION: UTILITY LINES DEPICTED ON THIS SURVEY ARE BASED UPON PAINT MARKS SET BY APPLIED PROFESSIONAL SERVICES ON JUNE 16, 2021.

3.B: ACCURACY OF DEPICTED UTILITY INFORMATION: WILSON ENGINEERING DOES NOT PROVIDE FOR-HIRE UTILITY LOCATION AND/OR MARKING SERVICES, AND CAN NOT INDEPENDENTLY ASCERTAIN THE ACCURACY OF ANY DEPICTED UTILITY THAT WAS NOT DIRECTLY OBSERVED IN THE COURSE OF THIS SURVEY.

3.C: STATEMENT OF LIMITATIONS REGARDING UTILITY-DEPICTION ACCURACY: LAKE WHATCOM WATER AND SEWER DISTRICT HAS BEEN NOTIFIED THAT WILSON CAN NOT, AND DOES NOT, GUARANTEE THE ACCURACY, AT ANY LEVEL, OF DEPICTED UTILITIES BASED ON THIRD-PARTY PAINT MARKS OR RECORD INFORMATION.

CONTROL NOTES

HORIZONTAL DATUM:
NAD83(2011) WASHINGTON STATE PLANE (NORTH ZONE)

BASIS OF COORDINATES: COORDINATION AND MENSURATION ARE LOCAL GROUND VALUES, DERIVED FROM NETWORK ADJUSTED VRS RTK OBSERVATIONS BASED UPON THE WASHINGTON STATE REFERENCE NETWORK "NWWA". WSE CONTROL POINT #101, A MAG NAIL IN ASPHALT AT THE INTERSECTION OF GRAND VIEW LANE AND SWALLOW CIRCLE, IS HELD AS THE BASIS OF COORDINATES. SAID MONUMENT HAS THE FOLLOWING POSITION:

NORTHING = 627,972.37 USFT
EASTING = 1,281,682.73 USFT

BASIS OF BEARINGS: BEARINGS ARE NAD83(2011) WASHINGTON STATE PLANE (NORTH ZONE), DERIVED FROM NETWORK ADJUSTED VRS RTK OBSERVATIONS BASED UPON THE WASHINGTON STATE REFERENCE NETWORK "NWWA".

THE DERIVED INVERSE BETWEEN MONUMENTS #101 AND #100, A REBAR AND CAP SET IN THE NORTHWESTERLY SHOULDER IN FRONT OF #50 GRAND VIEW LANE, IS **SOUTH 35° 25' 18" WEST**, AT A DISTANCE OF **374.35 USFT**. THE POSITION FOR #100 IS:

NORTHING = 627,667.31 USFT
EASTING = 1,281,465.76 USFT

VERTICAL DATUM:
NAVD88 DATUM

PROJECT BENCHMARK: PROJECT BENCHMARK IS A REBAR AND CAP, WSE CONTROL POINT #103 AS SHOWN HEREON, HAVING AN ELEVATION OF 669.14 (NAVD88).

ON-SITE SURVEY CONTROL TABLE

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	627,667.31	1,281,465.76	621.47	Z RPC 905
101	627,972.37	1,281,682.73	625.93	Z MAG NAVD88
103	627,728.52	1,281,751.80	669.14	REBAR AND CAP
104	627,643.27	1,281,809.66	672.88	HUB AND NAIL
105	627,628.37	1,281,681.70	679.53	HUB AND TACK
106	627,723.10	1,281,908.67	680.70	REBAR AND CAP
107	627,886.92	1,282,032.45	692.52	REBAR AND CAP

SURVEYOR'S NOTES

- THIS TOPOGRAPHIC SURVEY BASEMAP IS INTENDED TO BE USED FOR PLANNING AND DESIGN PURPOSES. BOUNDARY AND RIGHT-OF-WAY LINES SHOWN ARE DERIVED FROM MAPS OF RECORD AND DO NOT PURPORT TO DEFINE OWNERSHIPS. ALL MONUMENTS SHOWN HEREON WERE VISITED DURING THE COURSE OF THIS SURVEY UNLESS OTHERWISE NOTED.
- ANGULAR AND LINEAR MEASUREMENTS WERE COLLECTED USING A COMBINATION OF GPS AND CONVENTIONAL METHODOLOGIES. PRIMARY CONTROL WAS COLLECTED USING A TRIMBLE R10-2 SURVEY-GRADE GPS RECEIVER OPERATING IN NETWORKED RTK MODE. FROM GPS CONTROL, A TRIMBLE S-6 ROBOTIC TOTAL STATION WAS USED TO TIE SECONDARY CONTROL POINTS AND COLLECT TOPOGRAPHIC DATA.

REFERENCE DOCUMENTS

- PLAT OF SUDDEN VALLEY, DIVISION 7 - VOL. 10 OF PLATS, PG. 63
- PLAT OF SUDDEN VALLEY, DIVISION 20 - VOL. 11 OF PLATS, PG. 39
- WATER TANK AND ACCESS ROAD EASEMENT, AFN 1971-1106257
- WATER AND SEWER EASEMENT, AFN 2100301393
- PUGET SOUND ENERGY EASEMENT, AFN 2019-0903798
- ACCESS, UTILITIES, AND RESERVOIR EASEMENT, AFN 2023-0501567

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT I AM A LICENSED LAND SURVEYOR IN THE STATE OF WASHINGTON, THAT THIS MAP IS BASED ON AN ACTUAL FIELD SURVEY DONE BY ME OR UNDER MY DIRECT SUPERVISION AND THAT ALL DATA SHOWN HEREON ACTUALLY EXISTS IN THE LOCATIONS SHOWN AT THE TIME OF THIS SURVEY. THIS TOPOGRAPHIC MAP WAS DONE AT THE REQUEST OF LAKE WHATCOM WATER AND SEWER DISTRICT IN 2021.

PAUL JONATHAN DARROW, P.L.S. NO. 50697

DATE

Paul Darrow

01/08/24

ABBREVIATIONS USED

AFN = AUDITOR'S FILE NUMBER
C = CENTERLINE
CONC = CONCRETE
CPP = CORRUGATED POLYETHYLENE PIPE
E = EAST
ELEV = ELEVATION
INV = INVERT
MON = MONUMENT
N = NORTH
NE = NORTHEAST
NW = NORTHWEST
R/W = RIGHT-OF-WAY
S = SOUTH
SE = SOUTHEAST
SW = SOUTHWEST
TYP = TYPICAL
W = WEST
WAC = WASHINGTON CODE
WSE = WILSON SURVEY/ENGINEERING

LEGEND - SIZE & SCALE MAY VARY

-----100-----	= MAJOR CONTOUR
-----	= MINOR CONTOUR
-----	= EXISTING PROPERTY LINE
-----	= EXISTING R/W CENTERLINE
-----	= EXISTING EASEMENT
-----	= EXISTING GRAVEL EDGE
-----	= EXISTING ASPHALT EDGE
-----	= EXISTING CONCRETE EDGE
-----	= EXISTING BUILDING
-----	= EXISTING CONC. BLOCK WALL
-----	= EXISTING ROCK WALL
-----	= EXISTING WATER LINE
-----	= EXISTING BURIED POWER LINE
-----	= EXISTING BURIED TELEPHONE/COMM
-----	= EXISTING BURIED SANITARY SEWER
●	= FOUND REBAR
△	= TRAVERSE POINT
Ⓟ	= POWER METER
Ⓟ	= EXISTING POWER VAULT
ⓧ	= EXISTING POWER JUNCTION BOX
ⓧ	= EXISTING TELE/COMM PEDESTAL
ⓧ	= EXISTING WATER VALVE
ⓧ	= EXISTING WATER METER
ⓧ	= EXISTING WATER MANHOLE
ⓧ	= EXISTING WATER VAULT
ⓧ	= EXISTING WATER BLOWOFF
ⓧ	= EXISTING SANITARY SEWER MANHOLE
ⓧ	= EXISTING 2" (ETC) CONIFEROUS TREE
ⓧ	= EXISTING 2" (ETC) DECIDUOUS TREE
ⓧ	= EXISTING BOLLARD
ⓧ	= EXISTING GATE POST



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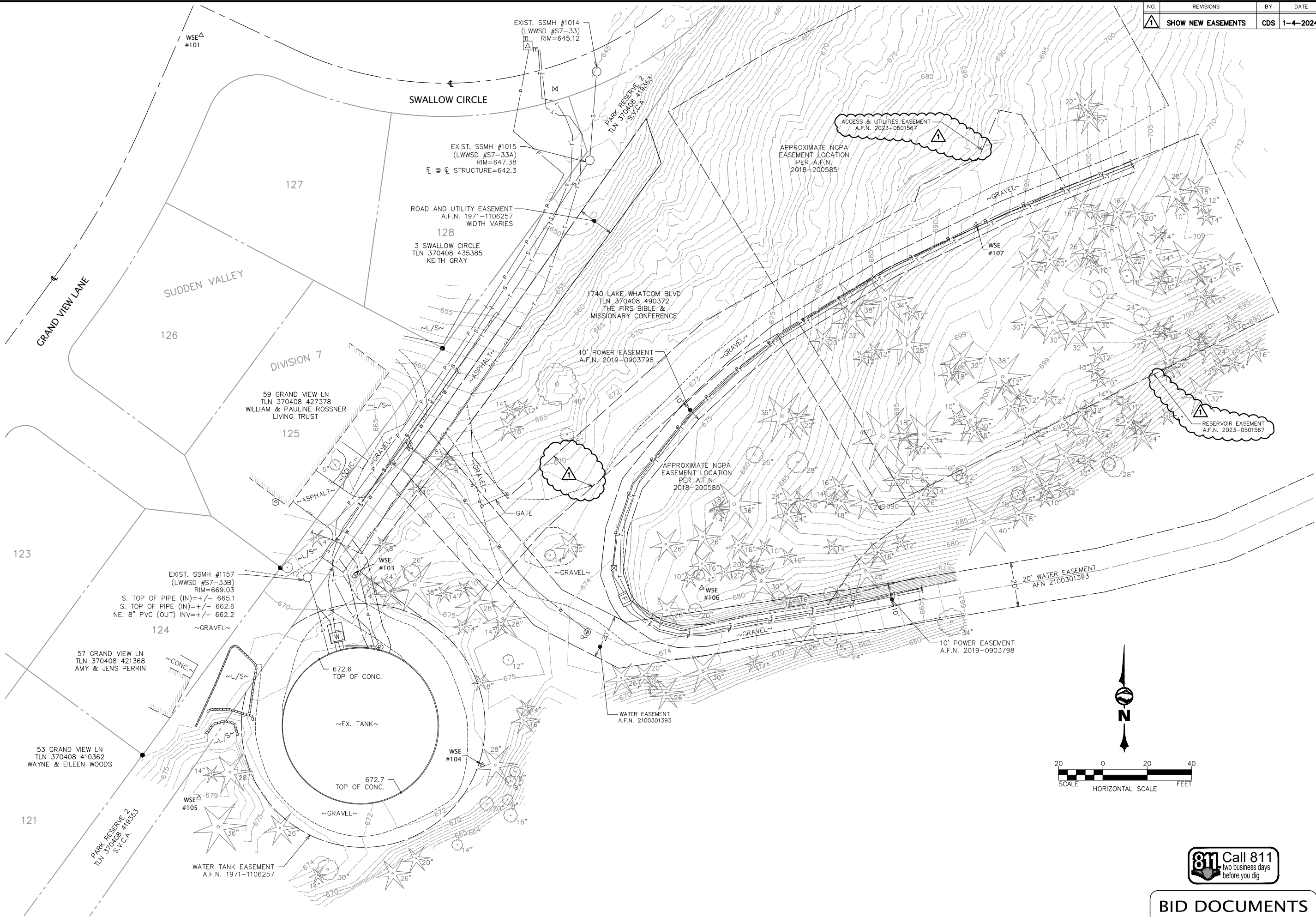
WHATCOM COUNTY

DIVISION 7 RESERVOIR REPLACEMENT PROJECT


W.A.C. 332-130 COMPLIANCE SHEET

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2021-130
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DIVISION 7 RESERVOIR REPLACEMENT PROJECT

EXISTING CONDITIONS

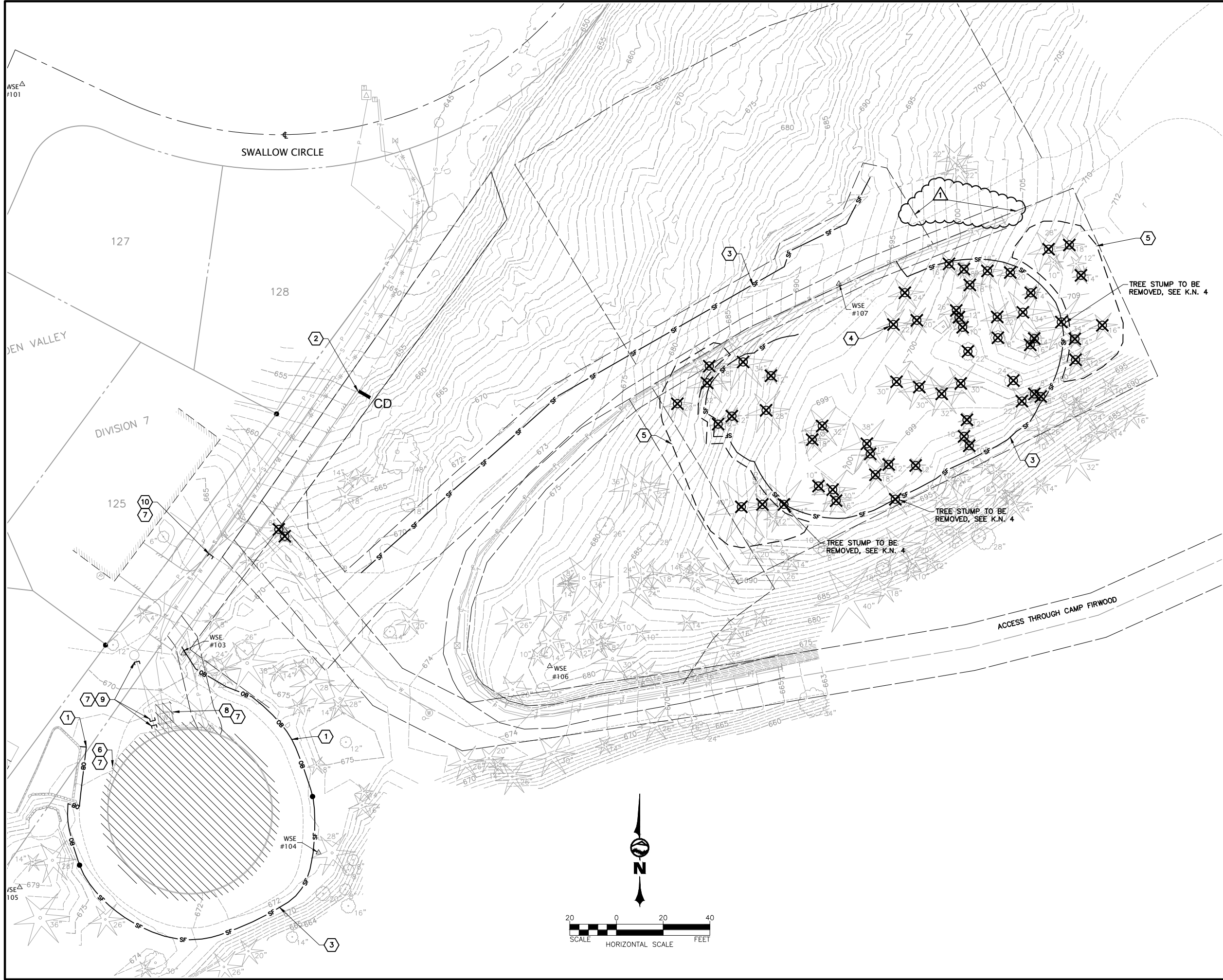
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811 Call 811
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- KEYED NOTES**
- 1 = ORANGE BARRIER FENCING $\frac{1}{C2.3}$
 - 2 = GEOTEXTILE ENCASED CHECK DAM $\frac{2}{C2.3}$
 - 3 = FILTER FABRIC FENCE $\frac{3}{C2.3}$
 - 4 = FELLED TREES TO BE LIMBED AND CUT TO 25-FT LENGTHS AND REMOVED, TYP. REMOVE STUMPS IN AREA TO BE GRADED. LOGS TO BE DELIVERED AND STACKED AT LOCATION NEAR ENTRANCE TO THE FIRS AS DIRECTED BY THE OWNER.
 - 5 = LEAVE STUMPS & STANDING TRUNKS.
 - 6 = EXISTING TANK TO BE DEMOLISHED, EXISTING CONCRETE FOUNDATION TO BE BROKEN UP INTO 1-FT NOMINAL PIECES TO ALLOW FOR DRAINAGE AND BURIED IN PLACE.
 - 7 = DEMOLITION AFTER BOTH PROPOSED TANKS ARE FULLY OPERATIONAL AND HAVE SUCCESSFULLY COMPLETED TESTING AND STARTUP. SEE ELECTRICAL SHEETS FOR ELECTRICAL DEMO.
 - 8 = REMOVE TOP LID/HATCH OF VAULT STRUCTURE. REMOVE INTERIOR FITTINGS, VALVES, & OTHER APPURTENANCES. SALVAGE ANY EQUIPMENT TO DISTRICT AS REQUESTED, OTHERWISE CONTRACTOR TO HAUL & DISPOSE. PLUG ALL PIPE ENDS W/ 2-FT MIN. CDF OR PROVIDE WATER TIGHT CAP/PLUG FITTINGS. FILL VAULT W/ SITE EXCAVATION SPOILS.
 - 9 = CUT AND CAP/PLUG (WATERTIGHT) EX TANK DRAIN-SEWER PIPING AT TANK AND MANHOLE. PIPING IS C.I. NEAR TANK AND CLAY TO SSMH.
 - 10 = CUT AND CAP/PLUG (WATERTIGHT) EX 10" C.I. WATERMAIN

SHEET NOTES:

1) SEE SHEET C1.1 FOR COMPLETE EXISTING CONDITIONS



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DEMO, TREE REMOVAL AND SWPPP PLAN	
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STORMWATER POLLUTION PREVENTION PLAN NOTES

SWPPP NARRATIVE

PROJECT DESCRIPTION: THE DIVISION 7 RESERVOIR PROJECT INVOLVES CONSTRUCTING 2 ~238,000 GALLON CONCRETE RESERVOIRS ~300 FT FROM THE EXISTING 1M GALLON WELDED STEEL RESERVOIR. APPROXIMATELY 375 LF OF 12-INCH WATERMAIN WILL BE INSTALLED ON-SITE. APPROXIMATELY 120 LF OF 8-INCH STORM PIPE WILL BE INSTALLED ON-SITE, AND APPROXIMATELY 30 LF OF SEWER PIPE WILL BE INSTALLED ON-SITE.

EXISTING SITE CONDITIONS: THE SITE IS CURRENTLY DEVELOPED WITH THE EXISTING RESERVOIR. THE LOCATION OF THE PROPOSED RESERVOIRS IS CURRENTLY FORESTED AND VEGETATED.

ADJACENT AREAS: ADJACENT AREAS INCLUDE RESIDENTIAL AREAS AND UNDEVELOPED LAND. EROSION AND SEDIMENTATION CONTROL BMPS WILL BE INSTALLED AS NECESSARY TO LIMIT EROSION AND SEDIMENT LEAVING THE PROJECT AREAS.

SOILS: SEE THE GEOTECHNICAL REPORT INCLUDED IN THE SPECIFICATIONS. SOILS CONSIST OF GLACIAL DEPOSITS, WEATHERED TO HIGHLY WEATHERED SILTSTONE AND SANDSTONE.

EROSION AND SEDIMENT CONTROL BMPS: ANTICIPATED BMPS THAT WILL BE UTILIZED INCLUDE: ORANGE BARRIER FENCING, GEOTEXTILE ENCASED CHECK DAM, STREET SWEEPING, PRESERVING NATURAL VEGETATION, PERMANENT SEEDING & PLANTING, AND FILTER FENCING. OTHER BMPS MAY BE UTILIZED TO MINIMIZE EROSION AND SEDIMENTATION TRANSPORT AS CONSTRUCTION SCHEDULES AND WEATHER CONDITIONS DICTATE.

PERMANENT STABILIZATION: ALL DISTURBED AREAS OUTSIDE OF ROADWAY SHOULDERS AND PARKING AREAS WILL BE PERMANENTLY LANDSCAPED OR SEEDED AND RESTORED TO THEIR EXISTING CONDITIONS.

MAINTENANCE: THE BMPS SHALL BE INSPECTED DAILY AND AFTER RAINFALL EVENTS. THE BMPS WILL BE MAINTAINED UNTIL THE RISK OF EROSION HAS PASSED AND THE AREA IS PERMANENTLY STABILIZED.

CALCULATIONS: NOT APPLICABLE.
NON-ESC BMPS REQUIRED: NONE NOTED.

SWPPP GENERAL NOTES

- BMPS: BEST MANAGEMENT PRACTICES (BMPS) REFERRED TO ON THIS PLAN AND IN THESE NOTES SHALL BE CONSTRUCTED AND MAINTAINED AS DESCRIBED IN DEPARTMENT OF ECOLOGY'S STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON, VOLUME II, CHAPTER 4, "BEST MANAGEMENT PRACTICES STANDARDS AND SPECIFICATIONS."
- EXTENT: THE EXTENT OF EROSION AND SEDIMENTATION CONTROL MEASURES IS DEPENDANT ON WEATHER CONDITIONS, SITE SLOPES, LENGTH OF TIME GROUND IS LEFT EXPOSED, AND THE AREA OF EXPOSED GROUND. THE CONTRACTOR SHALL AT ALL TIMES MINIMIZE THE RISK OF SITE EROSION BY CAREFUL SCHEDULING AND BY IMPLEMENTING AND MAINTAINING BMPS UNTIL THE SITE IS PERMANENTLY STABILIZED. THE EROSION AND SEDIMENTATION CONTROL MEASURES DESCRIBED IN THESE PLANS ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THE CONTRACTOR SHALL UPGRADE THESE ESC FACILITIES FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
- UNWORKED SOILS: ALL EXPOSED AND UNWORKED SOILS SHALL BE STABILIZED BY SUITABLE AND TIMELY APPLICATION OF BMPS.
- VEGETATION: EXISTING VEGETATION SHALL BE PRESERVED WHERE ATTAINABLE.
- SLOPES: CUT AND FILL SLOPES SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES SHALL BE STABILIZED AS SOON AS POSSIBLE.
- OUTLETS: STABILIZATION ADEQUATE TO PREVENT EROSION OF OUTLETS AND ADJACENT STREAM BANKS SHALL BE PROVIDED AT THE OUTLETS OF ALL CONVEYANCE SYSTEMS.
- ENTRANCES: WHEREVER UNPAVED CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED ROADS, PROVISION SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT (MUD) ONTO THE PAVED ROAD. IF SEDIMENT IS TRANSPORTED ONTO A ROAD SURFACE, THE ROADS ADJACENT TO THE CONSTRUCTION SITE SHALL BE CLEANED ON A DAILY BASIS. STREET WASHING SHALL BE ALLOWED ONLY AFTER OTHER METHODS TO PREVENT THE TRANSPORT OR TO REMOVE THE SEDIMENTS ARE UNSUCCESSFUL.
- SITE RUNOFF:PRIOR TO LEAVING THE SITE, STORMWATER RUNOFF SHALL PASS THROUGH A SEDIMENT POND OR TRAP, OR OTHER APPROPRIATE BMPS.
- ADJACENT PROPERTIES: PROPERTIES ADJACENT TO THE PROJECT SHALL BE PROTECTED FROM SEDIMENT DEPOSITION.
- CLEANUP: THE CONTRACTOR SHALL CLEANUP ALL AREAS AFFECTED BY THEIR ACTIVITIES TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE BY THE END OF EACH WORKING DAY OR MORE FREQUENTLY IF REQUIRED BY THE OWNER'S REPRESENTATIVE. THIS INCLUDES REMOVAL OF ALL DUST, MUD, ROCKS, ASPHALT DEBRIS, REUSE FROM THE STREETS, SIDEWALKS, DRIVEWAYS, CATCH BASINS AND ANY OTHER AREAS AFFECTED BY THE CONSTRUCTION ACTIVITIES. FAILURE TO CLEANUP TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE WILL NECESSITATE A SHUTDOWN OF THE PROJECT UNTIL CLEANUP IS PROPERLY PERFORMED. DAILY CLEANUP IS AN INTEGRAL PART OF EROSION AND POLLUTION CONTROL.
- REMOVAL OF BMPS: ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON-SITE. DISTURBED SOIL AREAS RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.
- INSPECTIONS: ALL BMPS SHALL BE INSPECTED, MAINTAINED, AND REPAIRED BY THE CONTRACTOR AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL ON-SITE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN DAYS AND WITHIN 24 HOUR AFTER ANY STORM EVENT OF GREATER THAN 0.5-INCHES OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAIN A MINIMUM OF ONCE A MONTH OR WITHIN 24 HOURS FOLLOWING A STORM EVENT.
- REPORTS: THE CONTRACTOR SHALL DESIGNATE ONE EMPLOYEE WHO WILL BE ON-SITE CERTIFIED EROSION AND SEDIMENT CONTROL LEAD (CESCL). THIS PERSON WILL BE RESPONSIBLE FOR ENSURING COMPLIANCE WITH ALL LOCAL, STATE AND FEDERAL EROSION AND SEDIMENT CONTROL AND SPILL CONTROL/PREVENTION REQUIREMENTS. THIS PERSON SHALL PROVIDE A CONTACT PHONE NUMBER THAT HE/SHE CAN BE REACHED AT 24 HOURS A DAY TO RESPOND TO EMERGENCIES, INQUIRES AND DIRECTIVES REGARDING TEMPORARY EROSION AND SEDIMENTATION CONTROL AND SPILL CONTROL. THE CESCL SHALL PREPARE AND MAINTAIN REPORTS SUMMARIZING THE SCOPE OF INSPECTIONS, THE PERSONNEL CONDUCTING THE INSPECTION, THE DATES OF THE INSPECTION, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE STORMWATER POLLUTION PREVENTION PLAN, AND ACTIONS TAKEN AS A RESULT OF THESE INSPECTIONS.
- OTHER REQUIREMENTS: THE ENGINEER, OWNER, WHATCOM COUNTY, DEPARTMENT OF ECOLOGY, OR OTHER AGENCIES MAY REQUIRE BMPS IN ADDITION TO WHAT IS SHOWN ON THIS PLAN IN ORDER TO PREVENT VIOLATIONS OF SURFACE WATER QUALITY AND GROUND WATER QUALITY. THE CONTRACTOR SHALL IMPLEMENT THE BMPS AS REQUIRED.

PROJECT BMPS

THE FOLLOWING BMPS SHALL BE IMPLEMENTED TO THE MAXIMUM EXTENT POSSIBLE:

BMP C101: PRESERVING NATURAL VEGETATION. CONTRACTOR SHALL CLEAR AND DISTURB ONLY AREAS REQUIRED TO CONSTRUCT IMPROVEMENTS AND SHALL DILIGENTLY MINIMIZE DISTURBED AREA.

BMP C102: BUFFER ZONES. CONTRACTOR SHALL MARK CLEARING LIMITS AND KEEP ALL EQUIPMENT AND CONSTRUCTION DEBRIS OUT OF NATURAL AREAS.

BMP C103: HIGH VISIBILITY FENCE. CONTRACTOR SHALL INSTALL HIGH VISIBILITY FENCE IN LOCATIONS NOTED ON PLANS.

BMP C105: STABILIZED CONSTRUCTION ENTRANCE. CONTRACTOR SHALL INSTALL AND MAINTAIN CONSTRUCTION ENTRANCE TO SITE.

BMP C120: PERMANENT SEEDING & PLANTING. CONTRACTOR SHALL COMPLETE REQUIRED LANDSCAPING AS RAPIDLY AS POSSIBLE.

BMP C122/123: COVER MEASURES. CONTRACTOR SHALL EMPLOY NETS, BLANKETS, OR SHEETING A NEEDED TO REDUCE EROSION WHILE PLANTS ESTABLISH.

BMP C130: SURFACE ROUGHENING. CONTRACTOR SHALL ROUGHEN DISTURBED AREAS PRIOR TO PERMANENT SEEDING AND PLANTING.

BMP C140: DUST CONTROL. CONTRACTOR SHALL KEEP DUST FROM CONSTRUCTION ACTIVITIES AND EXPOSED SOILS TO A MINIMUM.

BMP C151/154: CONCRETE HANDLING. CONTRACTOR SHALL PREVENT CONCRETE WASH FROM RUNNING OFF-SITE.

BMP C233: FILTER FENCE. CONTRACTOR SHALL INSTALL FENCE IN LOCATIONS NOTED ON PLANS.

BMP C235: WATTLES. CONTRACTOR SHALL INSTALL WATTLES AS NEEDED.

STREET SWEEPING: CONTRACTOR SHALL SWEEP ADJACENT ASPHALT AND CONCRETE SURFACES CLEAN OF DIRT AND SEDIMENT AT THE END OF EACH WORK DAY.



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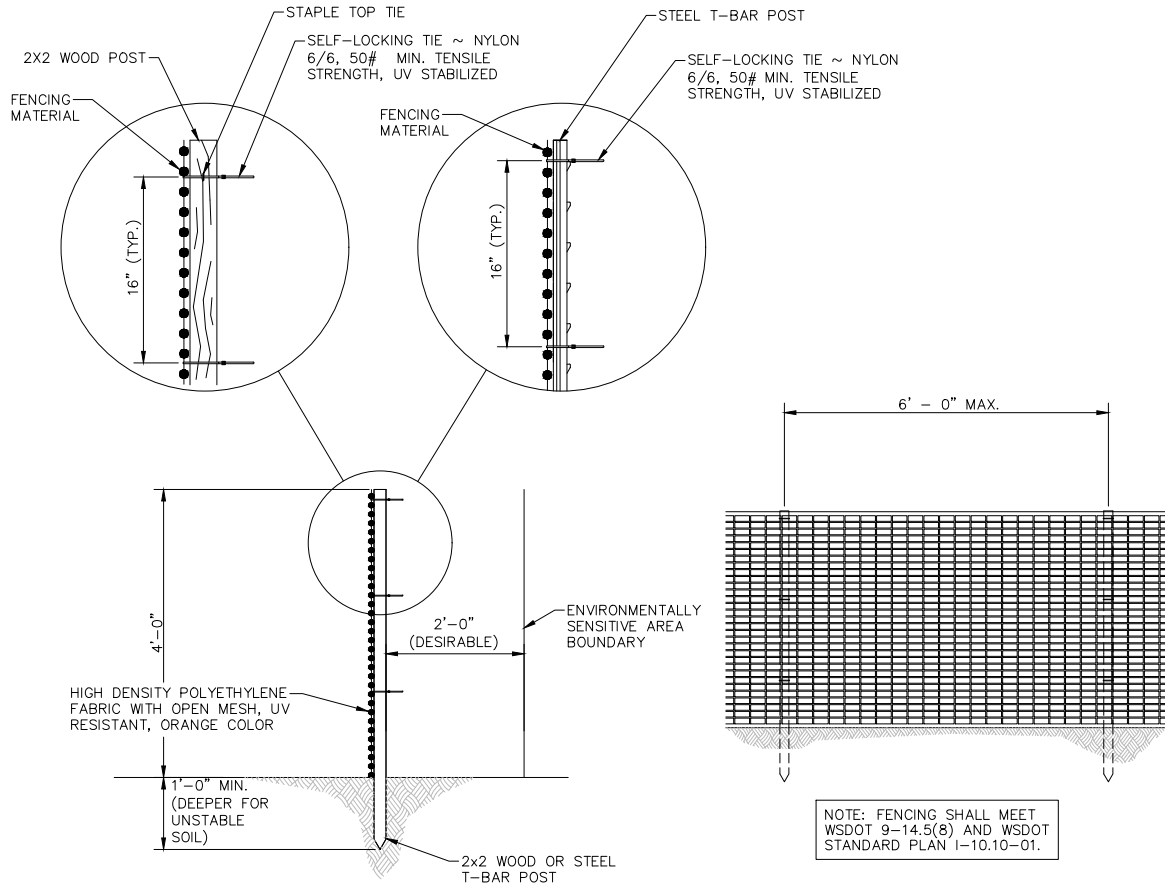
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WHATCOM COUNTY

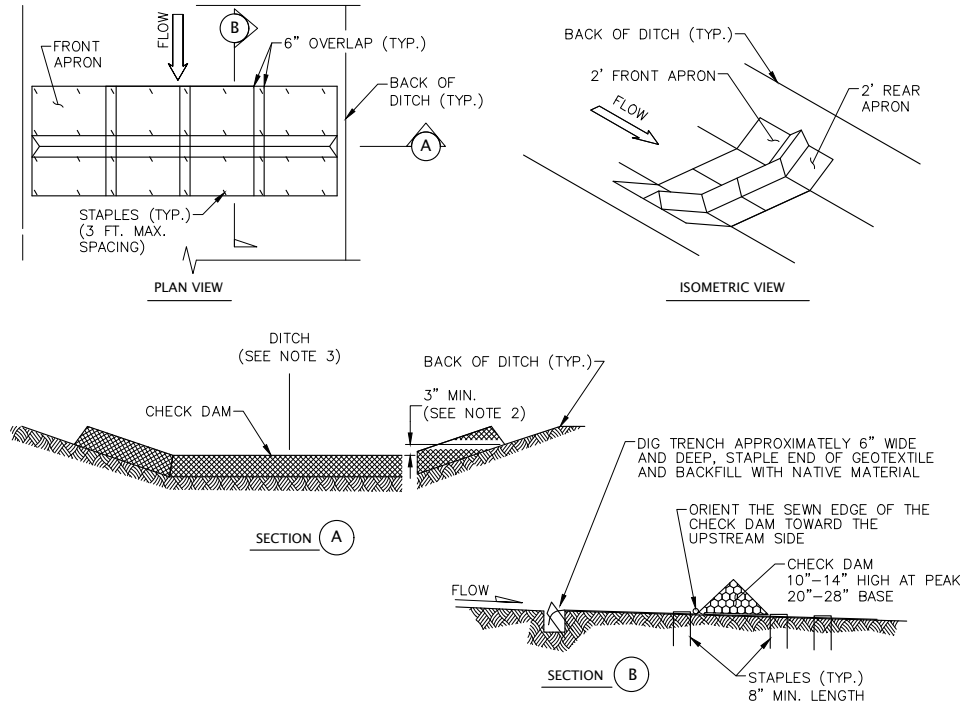
DIVISION 7 RESERVOIR REPLACEMENT PROJECT

SWPPP NOTES

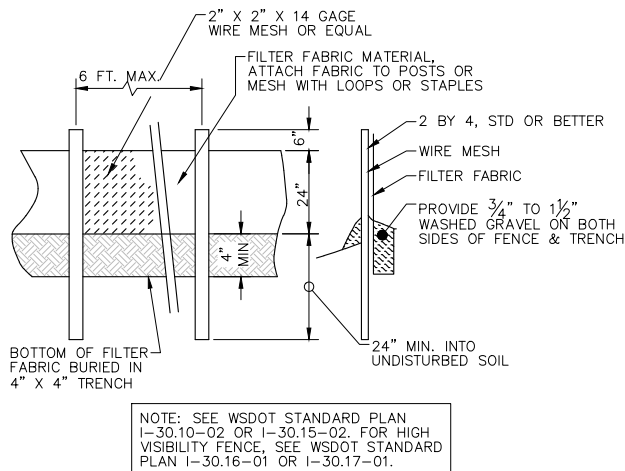
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1 ORANGE BARRIER FENCING
NOT TO SCALE



2 GEOTEXTILE ENCASED CHECK DAM
NOT TO SCALE



3 FILTER FABRIC FENCE
NOT TO SCALE

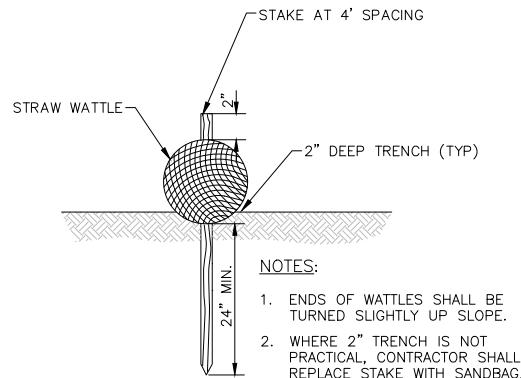
BMP C233 - SILT (FILTER FABRIC) FENCE

PURPOSE: USE OF A SILT FENCE REDUCES THE TRANSPORT OF COARSE SEDIMENT FROM A CONSTRUCTION SITE BY PROVIDING A TEMPORARY PHYSICAL BARRIER TO SEDIMENT AND REDUCING THE RUNOFF VELOCITIES OF OVERLAND FLOW.

INSTALLATION: USE DOWN SLOPE OF DISTURBED AREAS AS SHOWN ON THE PLAN AND AS NEEDED TO RESPOND TO SITE SPECIFIC CONDITIONS. GEOTEXTILE SHALL MEET WSDOT 9-33.2(1) TABLE 6. HIGH VISIBILITY FENCING SHALL MEET WSDOT 9-14.5(9). STANDARD STRENGTH FABRICS SHALL BE SUPPORTED WITH WIRE MESH, CHICKEN WIRE, 2-INCH X 2-INCH WIRE, SAFETY FENCE, OR JUTE MESH TO INCREASE THE STRENGTH OF THE FABRIC. SILT FENCE MATERIALS ARE AVAILABLE THAT HAVE SYNTHETIC MESH BACKING ATTACHED.

THE MINIMUM HEIGHT OF THE TOP OF THE SILT FENCE SHALL BE 2 FEET AND THE MAXIMUM HEIGHT SHALL BE 4 FEET.

MAINTENANCE: INSPECT THE FENCE AFTER RAINFALL EVENTS FOR SEDIMENT DEPOSITS UPSTREAM OF THE FENCE. REMOVE SEDIMENT DEPOSITS WHEN THEY REACH A DEPTH OF APPROXIMATELY 8 INCHES DEEP. REPLACE FILTER FABRIC FENCES DAMAGED BY CONSTRUCTION EQUIPMENT OR ULTRAVIOLET BREAKDOWN.



4 STRAW WATTLE DETAIL
NOT TO SCALE

BMP C208 - GEOTEXTILE ENCASED CHECK DAM

PURPOSE: GEOTEXTILE ENCASED CHECK DAMS MAY BE USED AS CHECK DAMS, FOR PERIMETER PROTECTION, FOR TEMPORARY SOIL STOCKPILE PROTECTION, FOR DROP INLET PROTECTION, OR AS A TEMPORARY INTERCEPTOR DIKE.

INSTALLATION: INSTALL WITH ENDS CURVED UP TO PREVENT WATER FROM FLOWING AROUND ENDS. THE FABRIC FLAPS AND CHECK DAM UNITS ARE ATTACHED TO THE GROUND WITH WIRE STAPLES. WIRE STAPLES SHOULD BE NO. 11 GAUGE AND SHOULD BE 200MM TO 300MM IN LENGTH. WHEN MULTIPLE UNITS ARE INSTALLED, THE SLEEVE OF FABRIC AT THE END OF THE UNIT SHALL OVERLAP THE ABUTTING UNIT AND BE STAPLED. CHECK DAMS SHOULD BE LOCATED AND INSTALLED AS SOON AS CONSTRUCTION WILL ALLOW AND SHOULD BE PLACED PERPENDICULAR TO THE FLOW OF WATER. WHEN USED AS CHECK DAMS, THE LEADING EDGE MUST BE SECURED WITH ROCKS, SANDBAGS, OR A SMALL KEY SLOT AND STAPLES. IN THE CASE OF GRASS-LINED DITCHES AND SWALES, CHECK DAMS AND ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN THE GRASS HAS MATURED SUFFICIENTLY TO PROTECT THE DITCH OR SWALE UNLESS THE SLOPE OF THE SWALE IS GREATER THAN 4 PERCENT. THE AREA BENEATH THE CHECK DAMS SHALL BE SEEDED AND MULCHED IMMEDIATELY AFTER DAM REMOVAL.

MAINTENANCE: CHECK DAMS SHALL BE MONITORED FOR PERFORMANCE AND SEDIMENT ACCUMULATION DURING AND AFTER EACH RUNOFF PRODUCING RAINFALL. SEDIMENT SHALL BE REMOVED WHEN IT REACHES ONE HALF THE HEIGHT OF THE DAM. ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE TRIANGULAR SILT DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. IMMEDIATELY REPAIR ANY DAMAGE OR ANY UNDERCUTTING OF THE DAM.

NOTES:

- GEOTEXTILE ENCASED CHECK DAMS SHALL MEET THE REQUIREMENTS OF STANDARD SPECIFICATIONS 8-01.3(6)A AND 9-14.5(4).
- INSTALL THE SLOPED ENDS OF THE CHECK DAM A MINIMUM OF 3" HIGHER THAN THE TOP OF THE CHECK DAM IN THE CHANNEL TO ENSURE THAT WATER FLOWS OVER THE DAM AND NOT AROUND IT.
- FLAT BOTTOM DITCH DESIGN SHOWN, CHECK DAM INSTALLATION DETAILS ARE SIMILAR FOR "V" BOTTOM DITCHES.
- PERFORM MAINTENANCE IN ACCORDANCE WITH STANDARD SPECIFICATION 8-01.3(15).

NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR UPDATING COVERAGE UNDER THE DOE'S "CONSTRUCTION STORMWATER GENERAL PERMIT". CONTACT LINDA MATLOCK AT DOE (360-407-6437, EMAIL: LMAT461@ECY.WA.GOV) FOR ADDITIONAL INFORMATION.



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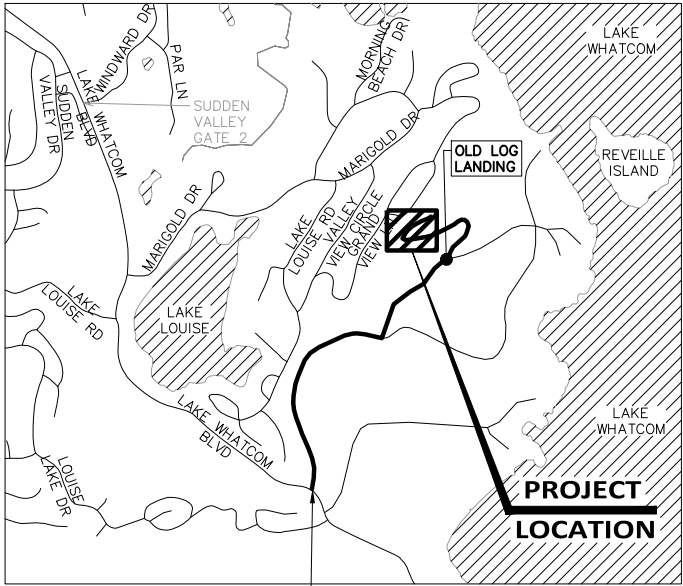
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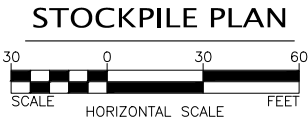
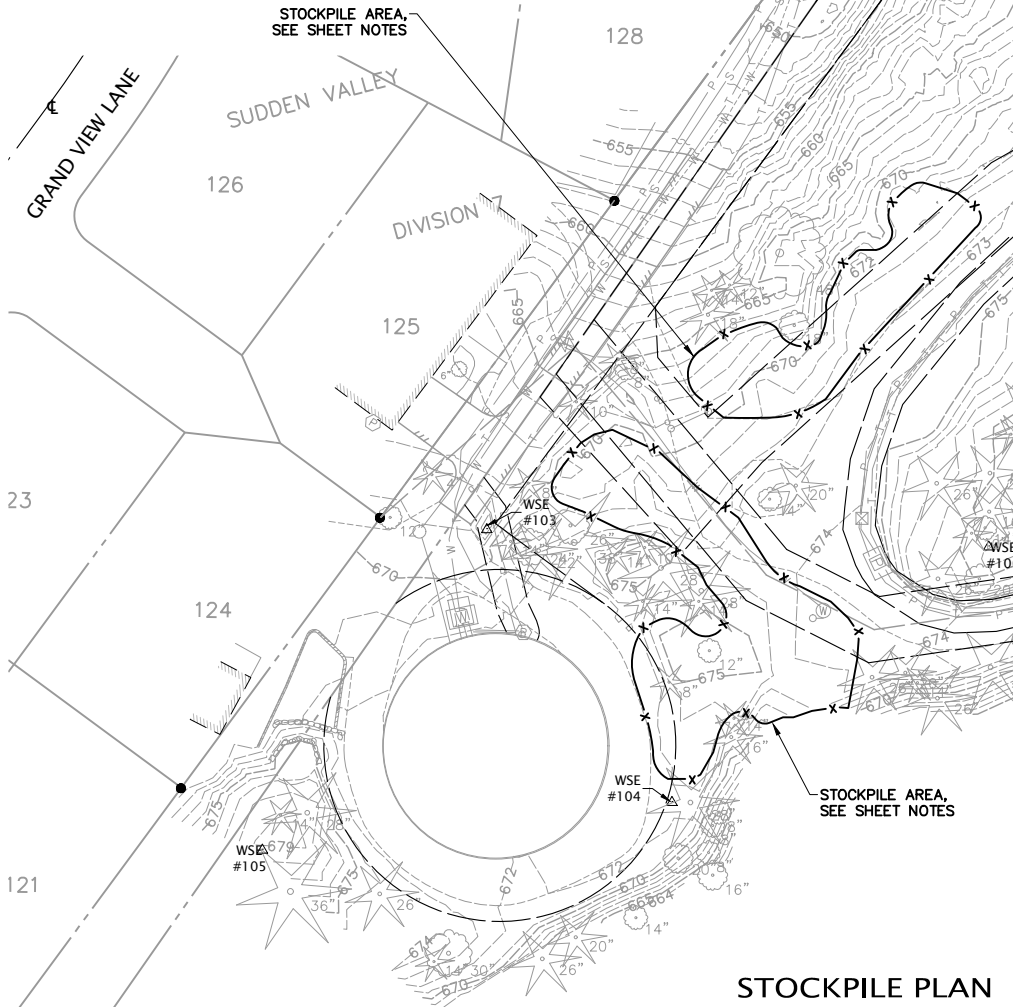
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PROJECT CONSTRUCTION ACCESS:
CAMP FIRWOOD
1740 LAKE WHATCOM BLVD, BELLINGHAM

SITE ACCESS
NOT TO SCALE



- SHEET NOTES:
- EXCAVATED MATERIAL SHALL BE STOCK-PILED AT THE DESIGNATED TEMPORARY PROJECT STOCK PILE LOCATIONS AS SHOWN, OR SHALL BE IMMEDIATELY HAULED OFF-SITE AND DISPOSED TO A LOCATION OBTAINED AND PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH ALL STATE AND COUNTY REGULATIONS.
 - EXCAVATED MATERIALS THAT ARE STOCKPILED SHALL BE STABILIZED WITH TOPSOIL OR WOODCHIP MULCH AND EROSION CONTROL FABRIC. THE TEMPORARY STOCKPILE LOCATION CAN BE USED FOR UP TO 1-YEAR AND UNTIL THE EXISTING TANK IS DEMOLISHED. IF THE CONTRACTOR USES THE TEMPORARY STOCK PILE SITE, THE STOCK PILE SITE AND ACCESS ROAD TO THE SITE, MUST BE RESTORED TO PRE-CONSTRUCTION CONDITIONS. NO TREES > 8-INCH DIAMETER SHALL BE REMOVED. PROTECT TREES WITH ECOBLOCK BARRIER, OR SIMILAR, AS NEEDED.
 - SEE SHEET C.1. FOR COMPLETE EXISTING CONDITIONS.

STOCKPILE AREA,
SEE SHEET NOTES

APPROXIMATE
LOCATION OF
TOWER SITE

STOCKPILE AREA AT "OLD
LOG LANDING" SITE
APPROXIMATELY 1,000 FT
DOWN GRAVEL ACCESS.
SEE SITE ACCESS INSET,
TOP LEFT THIS SHEET.
SEE NOTES



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DIVISION 7 RESERVOIR REPLACEMENT PROJECT

ACCESS, STAGING AND STOCKPILING PLAN

SHEET
C3.1

DATE
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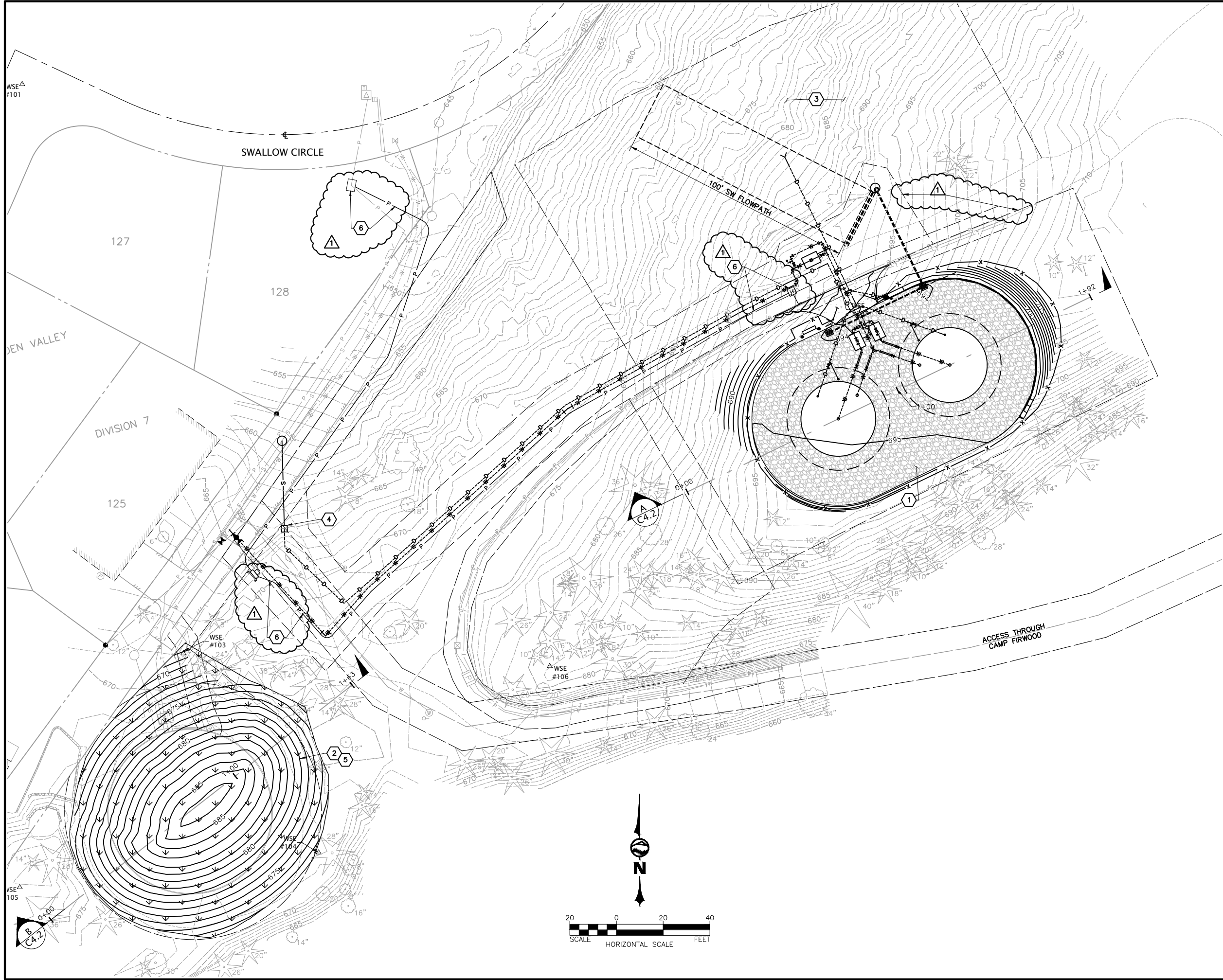
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- KEYED NOTES**
- 1 = PROPOSED TANK SITE AREA
 - 2 = EXISTING TANK AREA, FILLED, GRADED AND RESTORED TO NATIVE VEGETATION AFTER EXISTING TANK IS DEMOLISHED. DEMOLITION TO FOLLOW AFTER BOTH PROPOSED TANKS ARE FULLY OPERATIONAL AND HAVE SUCCESSFULLY COMPLETED TESTING AND STARTUP.
 - 3 = EXISTING CONSERVATION EASEMENT FOR FULL DISPERSION AREA FROM ROAD TO TOWER
 - 4 = TANK COMBINED OVERFLOW/DRAIN AIR GAP STRUCTURE, DRAINS TO SEWER.
 - 5 = SITE PLAN AT THE EXISTING TANK SITE REPRESENTS FINAL GRADE IF CONTRACTOR ELECTS TO USE THE PROJECT'S DESIGNATED TEMPORARY STOCKPILE LOCATION. SEE ALTERNATE FINISHED GRADE PROFILE ON B
C4.2
 - 6 = SEE ELECTRICAL DRAWINGS FOR NEW ELECTRICAL WIRING & APPURTENANCES

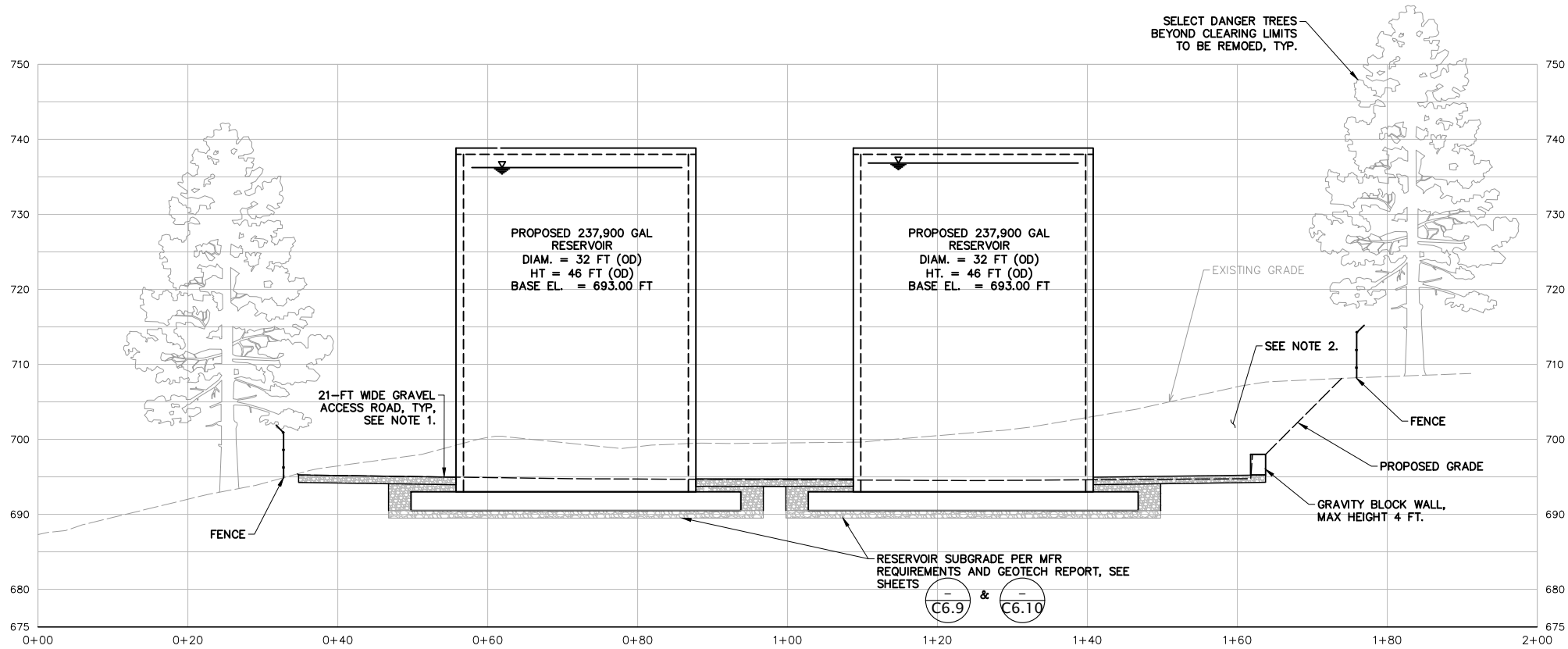
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1) SEE SHEET C1.1 FOR COMPLETE EXISTING CONDITIONS



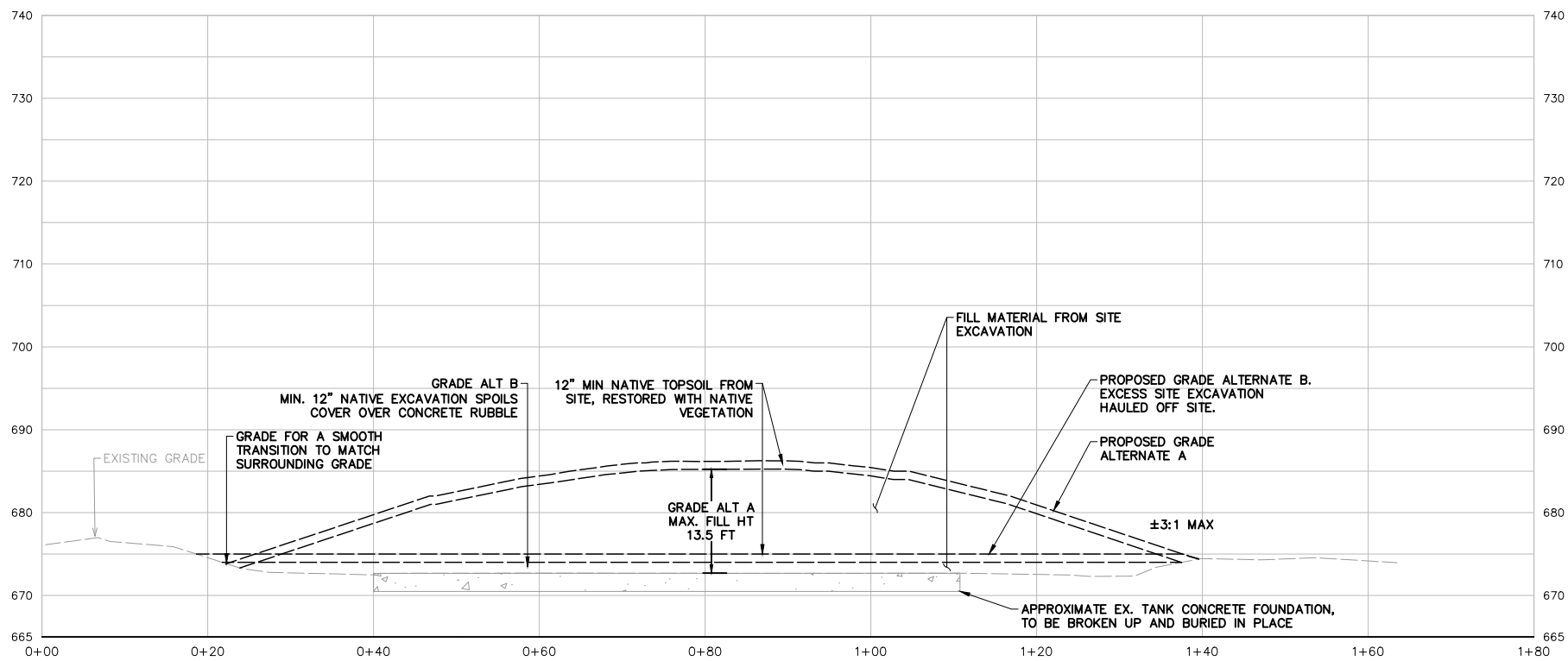
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		DRAWN BY EJH/LMH	SCALE AS SHOWN		PAGE 10 OF 50
		CHECKED BY MMM	JOB NUMBER 2021-130		
LAKE WHATCOM WATER AND SEWER DISTRICT WHATCOM COUNTY DIVISION 7 RESERVOIR REPLACEMENT PROJECT OVERALL SITE PLAN					

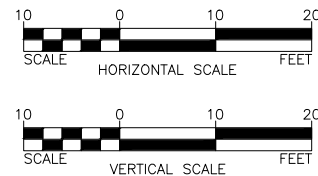
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SECTION 'A' - PROPOSED TANK SITE PROFILE
A
C4.1



SECTION 'B' - EXISTING TANK SITE RESTORATION PROFILE & ALTERNATE FINISHED GRADE PROFILE
B
C4.1



NOTES:

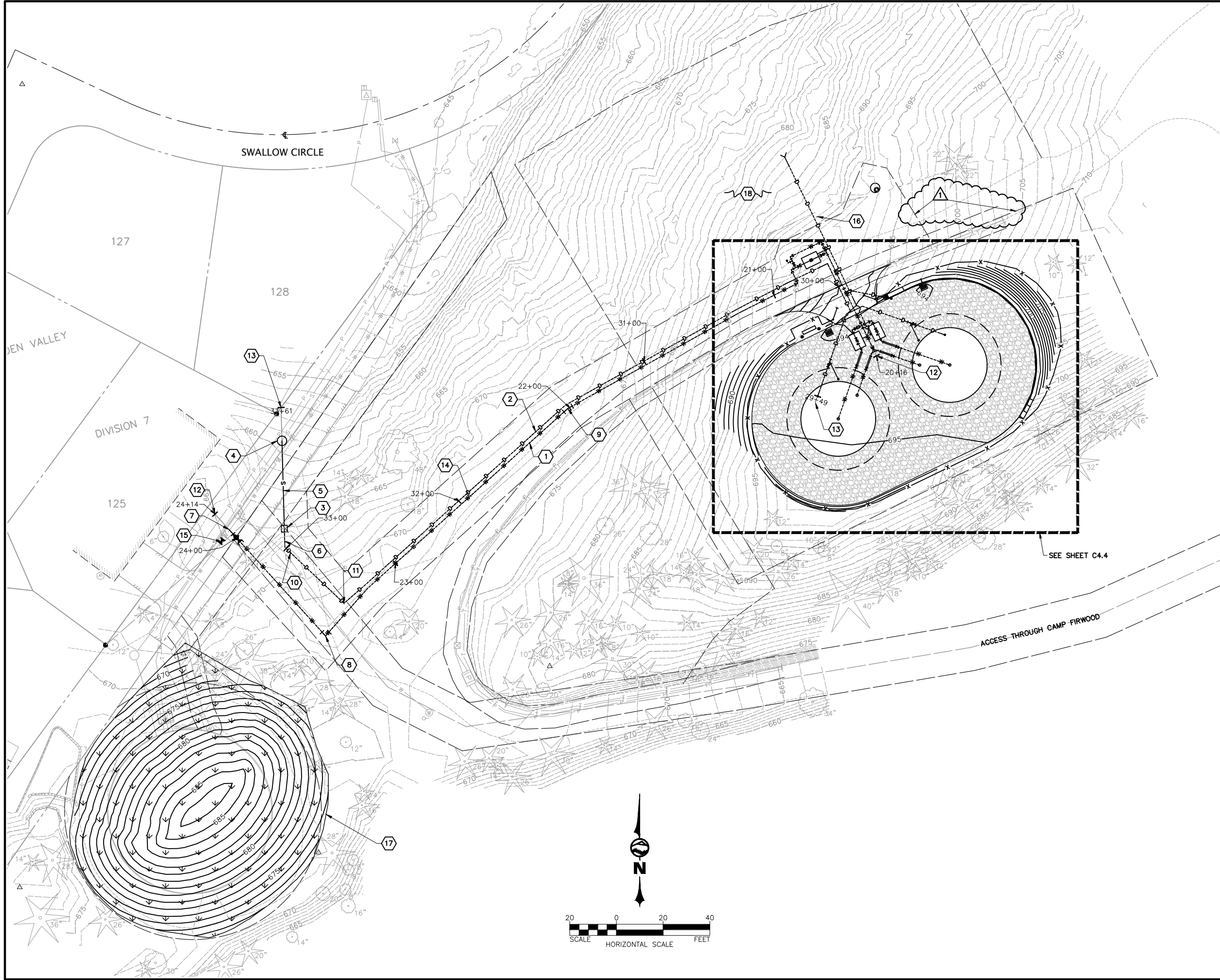
1. CRUSHED GRAVEL SURFACING MATERIAL EITHER IMPORTED CSBC PER WSDOT 9-03.9(3), OR PROCESSED/CRUSHED SANDSTONE ROCK EXCAVATED FROM SITE. MINIMUM THICKNESS 1-FT. COORDINATE REQUIREMENTS ADJACENT THE TANK WITH MFR AS SHOWN PER "TYPICAL BURIED TANK SECTION" DETAIL ON C6.10
2. EXCAVATED MATERIAL SHALL BE STOCK-PILED AT THE DESIGNATED TEMPORARY PROJECT STOCKPILE LOCATION AS SHOWN ON OR SHALL BE IMMEDIATELY HAULED OFF-SITE AND DISPOSED TO A LOCATION OBTAINED AND PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH ALL STATE AND COUNTY REGULATIONS. C3.1



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WHATCOM COUNTY	
DIVISION 7 RESERVOIR REPLACEMENT PROJECT	
RESERVOIR PROFILES	
SHEET C4.2	DATE 10-11-2023
PAGE 11 OF 50	SCALE AS SHOWN
JOB NUMBER 2021-130	

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- KEYED WATER NOTES**
- 1 = 12" DI WATER LINE
 - 7 = HOT-TAP CONNECTION TO EXISTING 10" DI, 10" TAPPING SLEEVE, FL 10"x12" REDUCER, FL 12" GATE VALVE, FLxMJ
 - 8 = 12" DI 90 DEG BEND, MJxMJ
 - 9 = 12" DI 11.25 DEG BEND, MJxMJ, WITH MEGALUG RESTRAINTS. CONTRACTOR TO INSTALL UNCUT FULL LENGTH STICKS OF PIPE ON EITHER SIDE OF THE BEND.
 - 12 = WATER ALIGNMENT. SEE PROFILE PER C4.6
 - 14 = COMBINED TRENCH, PER C5.5
 - 15 = 10" AVT EZ VALVE, OR EQUAL CLOSE VALVE, TERMINATE EX. PIPE W/ FULL PRESSURE RATED FITTING AND PLUG OR BLIND FLANGE. INSTALL DEAD END THRUST BLOCKING. COORDINATE WITH DEMO NOTES SHEET C2.1

- KEYED OVERFLOW & DRAIN NOTES**
- 2 = 8" PVC DRAIN LINE
 - 3 = AIR GAP STRUCTURE, DRAIN TO SAN. SEWER, TYPE 1 MODIFIED CATCH BASIN PER C5.3
 - 4 = NEW SSMH LWSD S7-33C 48" DIAM. SANITARY SEWER SADDLE MANHOLE, PER C5.3
 - 5 = 8" PVC SANITARY SEWER
 - 6 = TRANSITION TO 8" DI PIPE 5' MIN PRIOR TO DAYLIGHTING AT AIR GAP DISCHARGE
 - 10 = 8" PVC 45 DEG BEND
 - 11 = 8" PVC 90 DEG BEND
 - 13 = DRAIN ALIGNMENT. SEE PROFILE PER C4.6
 - 16 = VAULTS DRAIN TO DAYLIGHT

- KEYED MISC. NOTES**
- 17 = NOTE: GRADING PLAN REPRESENTS GRADING PROFILE ALTERNATE A. GRADING PLAN FOR ALTERNATE B NOT SHOWN, SEE C4.2 FOR PROFILE
 - 18 = GRADING & DRAINAGE PLAN FOR STORM DRAINS & DISPERSION TRENCH, SEE C4.7

SHEET NOTES:

- SEE SHEET C1.1 FOR COMPLETE EXISTING CONDITIONS
- THRUST BLOCKING IS NOT CALLED OUT BUT SHALL BE INSTALLED PER DETAILS ON C5.1 APPLIES TO BOTH WATER AND OVERFLOW DRAIN PIPING



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LAKE WHATCOM WATER AND SEWER DISTRICT

WHATCOM COUNTY

DIVISION 7 RESERVOIR REPLACEMENT PROJECT

RESERVOIR, WATER, OVERFLOW AND DRAIN PIPE PLAN

C4.3

PAGE

12

OF

50

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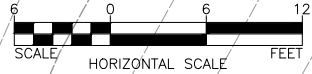
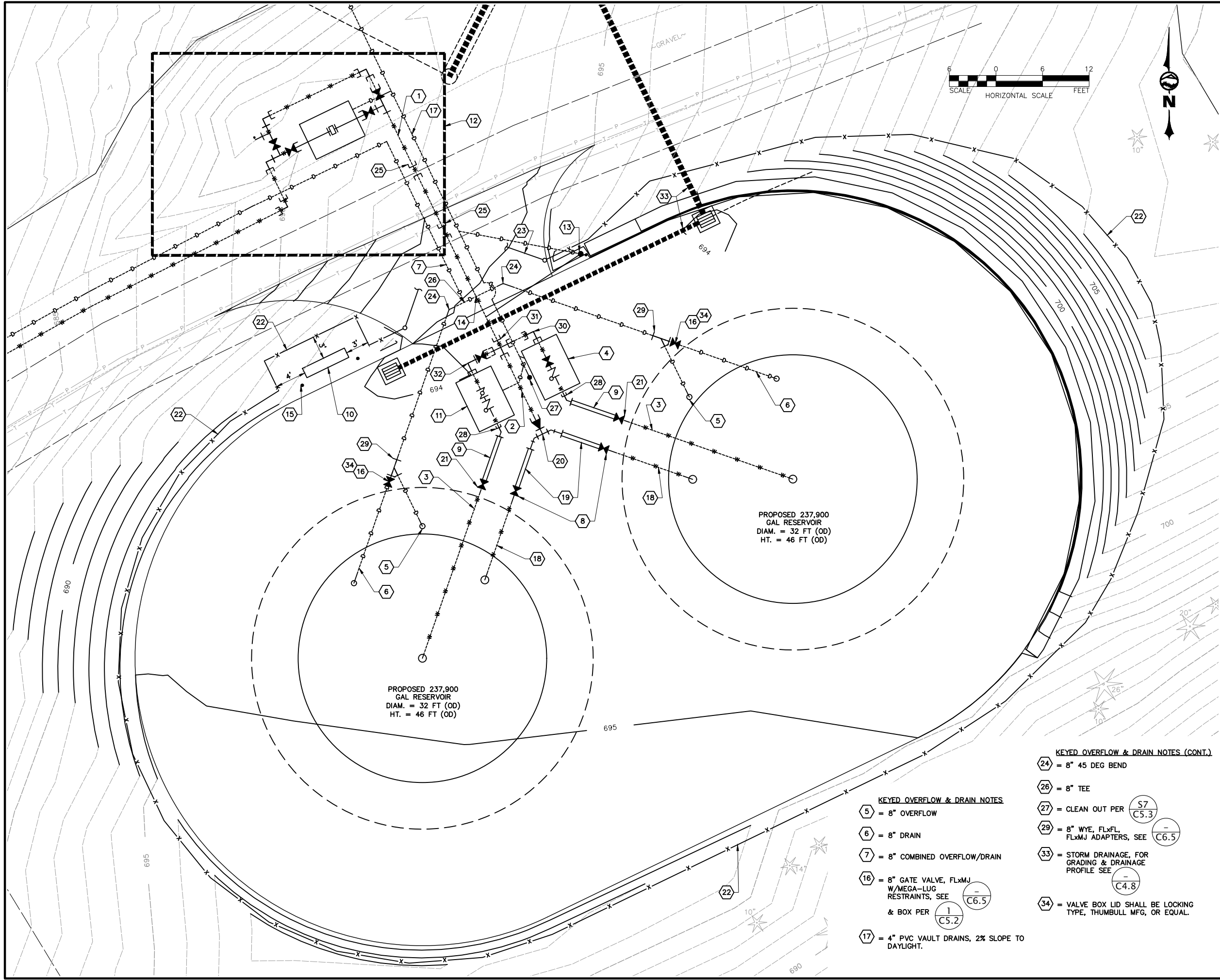
JOHN P. FOLDER

REGISTERED PROFESSIONAL ENGINEER

WASHINGTON STATE

NO. 18470

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- KEYED WATER NOTES**
- 1 = WATER MAIN, 12" DI INLET/OUTLET
 - 2 = 12" DI INLET
 - 3 = 12" DI OUTLET
 - 4 = OUTLET VALVE VAULT PER $\frac{3}{C4.5}$
 - 8 = 8" GATE VALVE, FLxMJ W/MEGA-LUG RESTRAINTS, SEE $\frac{-}{C6.4}$ & BOX PER $\frac{1}{C5.2}$
 - 9 = 12" FLEXIBLE EXPANSION JOINT, FLxFL
 - 11 = OUTLET VALVE VAULT w/SEISMIC VALVE PER $\frac{2}{C4.5}$
 - 13 = COMBINATION AIR RELEASE/AIR VACUUM VALVE ASSEMBLY, PER PLACE VALVE BOX AS SHOWN. PROVIDE 2" PERF PIPE AT BOTTOM OF METER BOX AND TIGHT LINE CONNECTION TO COMMON 4" VAULT DRAIN LINE TO DAYLIGHT $\frac{W8}{C5.1}$
 - 14 = 12" MIN. SEPARATION BETWEEN WATER AND DRAIN LINES, BACKFILL w/CDF
 - 18 = 8" DI INLET
 - 19 = 8" FLEXIBLE EXPANSION JOINT, FLxFL
 - 20 = 12"x8" RED FLxMJ, 8" TEE FLxFL, (2) 45 DEG BEND FLxFL
 - 21 = 12" GATE VALVE, FLxMJ W/MEGA-LUG RESTRAINTS, SEE $\frac{-}{C6.4}$ & BOX PER $\frac{1}{C5.2}$
 - 25 = 12" 11.25 DEG VERT BEND, MJxMJ, w/MEGALUG RESTRAINT
 - 28 = 12" 45 DEG BEND FLxMJ
 - 30 = 12" 90 DEG BEND, MJxMJ
 - 31 = 12" CROSS, MJxMJ
 - 32 = 12" 90 DEG BEND MJxFL, 12" GATE VALVE, FLxMJ
- KEYED MISC. NOTES**
- 10 = CONTROL PANEL, SEE ELEC/CONTROL SHEETS
 - 12 = RESERVOIR SITE PLAN DETAIL PER $\frac{-}{C4.8}$
 - 15 = BOLLARDS (TYP.) PER $\frac{4}{C5.2}$
 - 22 = 6-FT HIGH CHAINLINK FENCE, WSDOT TYPE 3 W/3-STRAND BARBED WIRE (TOTAL HEIGHT OF 7-FT)
 - 23 = 20-FT OF DOUBLE CHAIN LINK GATE (WSDOT L-30.10-02 WITH 3-STRAND BARBED WIRE).

- KEYED OVERFLOW & DRAIN NOTES**
- 5 = 8" OVERFLOW
 - 6 = 8" DRAIN
 - 7 = 8" COMBINED OVERFLOW/DRAIN
 - 16 = 8" GATE VALVE, FLxMJ W/MEGA-LUG RESTRAINTS, SEE $\frac{-}{C6.5}$ & BOX PER $\frac{1}{C5.2}$
 - 17 = 4" PVC VAULT DRAINS, 2% SLOPE TO DAYLIGHT.

- KEYED OVERFLOW & DRAIN NOTES (CONT.)**
- 24 = 8" 45 DEG BEND
 - 26 = 8" TEE
 - 27 = CLEAN OUT PER $\frac{S7}{C5.3}$
 - 29 = 8" WYE, FLxFL, FLxMJ ADAPTERS, SEE $\frac{-}{C6.5}$
 - 33 = STORM DRAINAGE, FOR GRADING & DRAINAGE PROFILE SEE $\frac{-}{C4.8}$
 - 34 = VALVE BOX LID SHALL BE LOCKING TYPE, THUMBULL MFG, OR EQUAL.

SHEET NOTES:

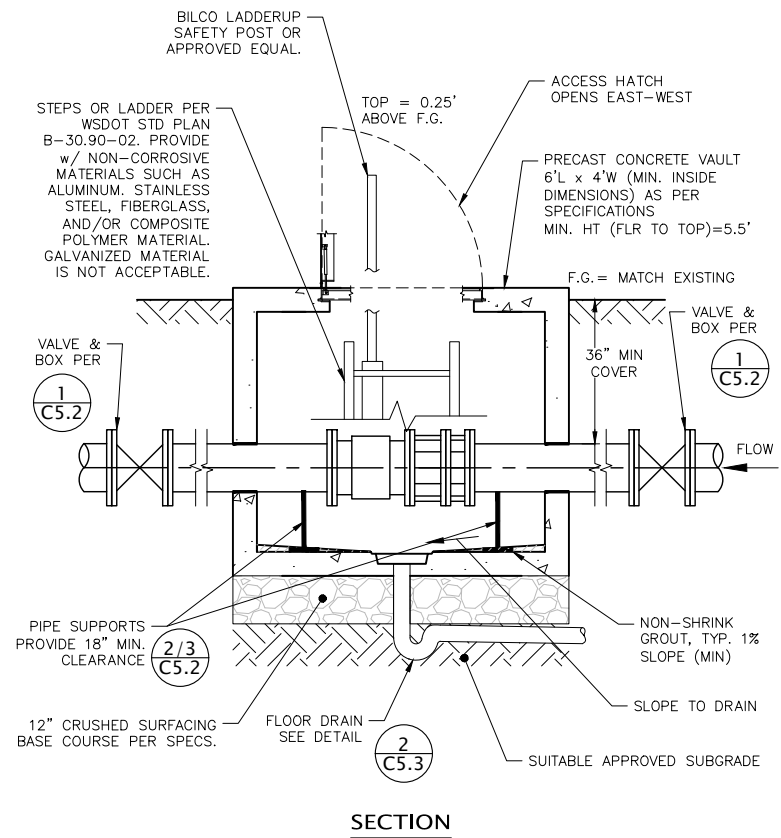
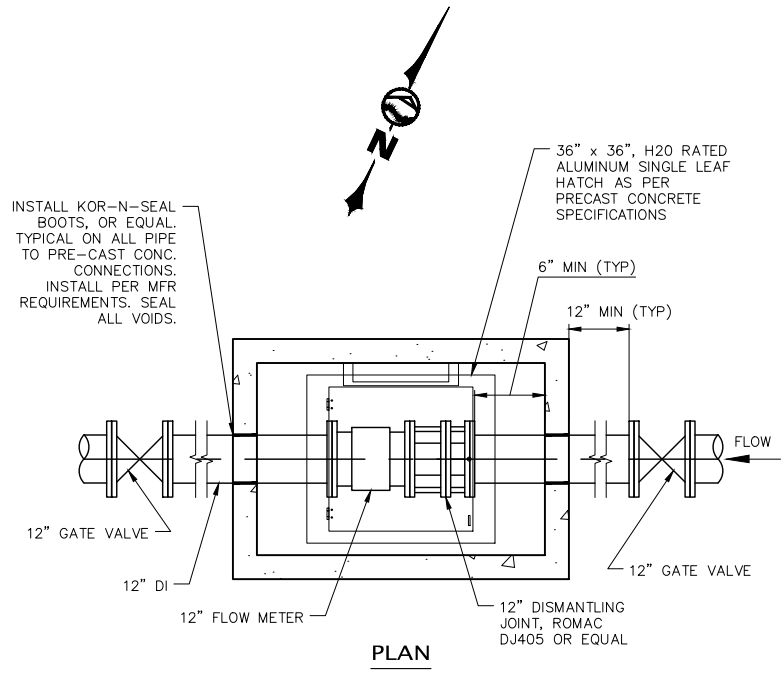
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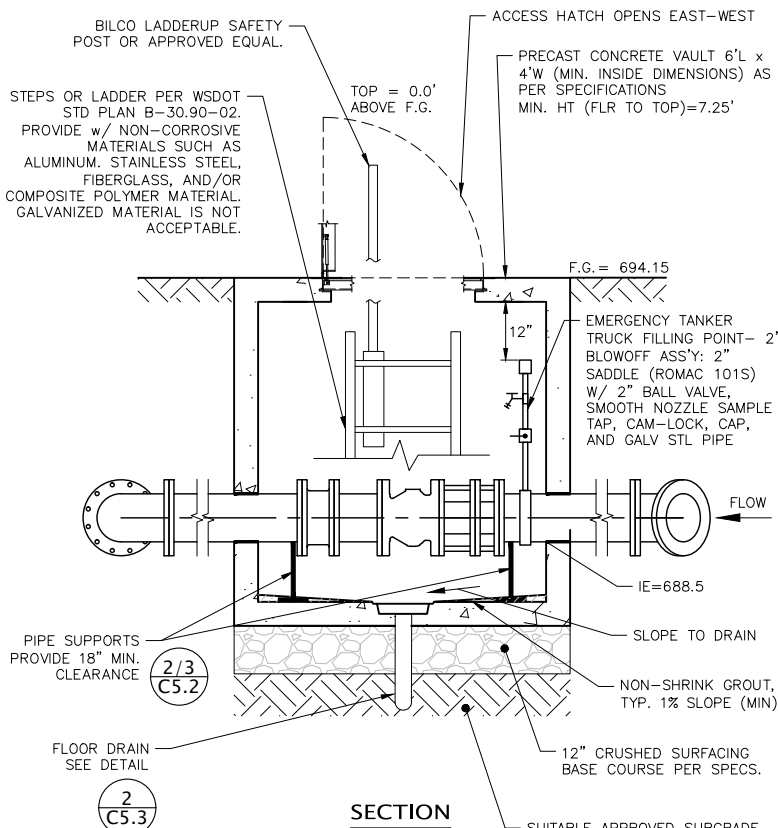
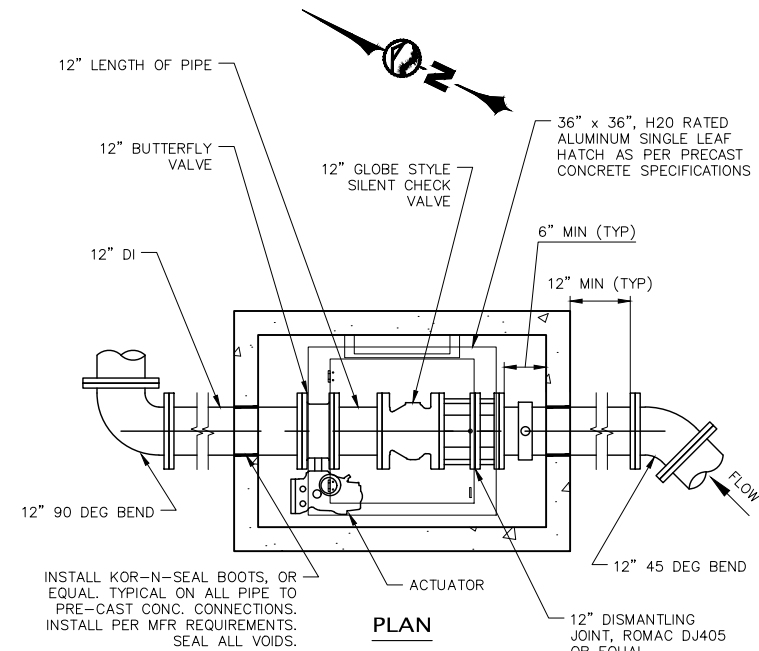
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WATER RESERVOIR SITE PLAN			
DATE 10-11-2023	SCALE AS SHOWN	JOB NUMBER 2021-130	SHEET C4.4
		PAGE 13	OF 50

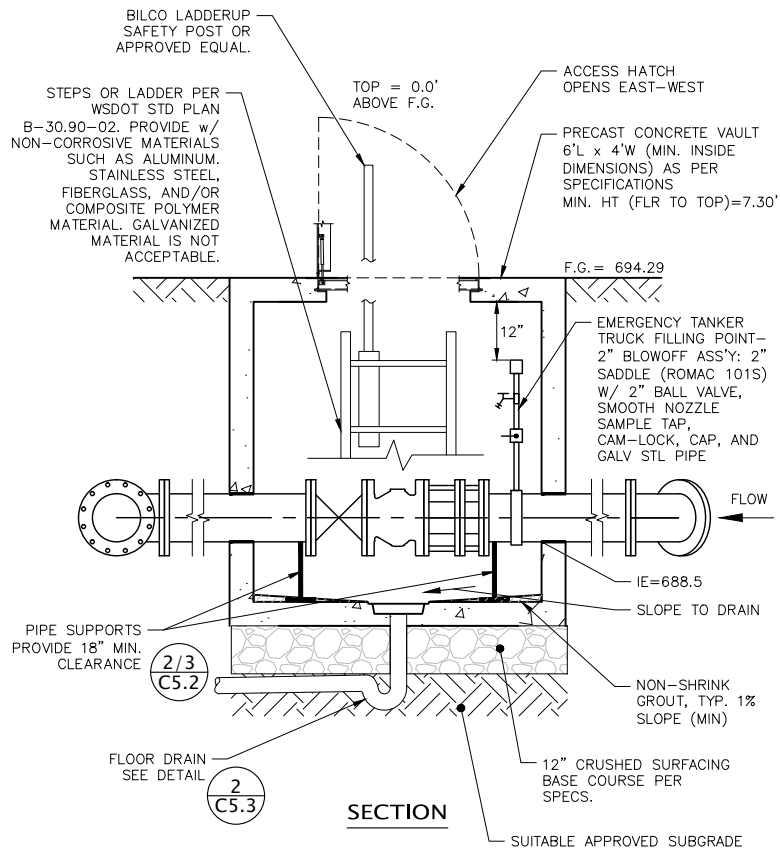
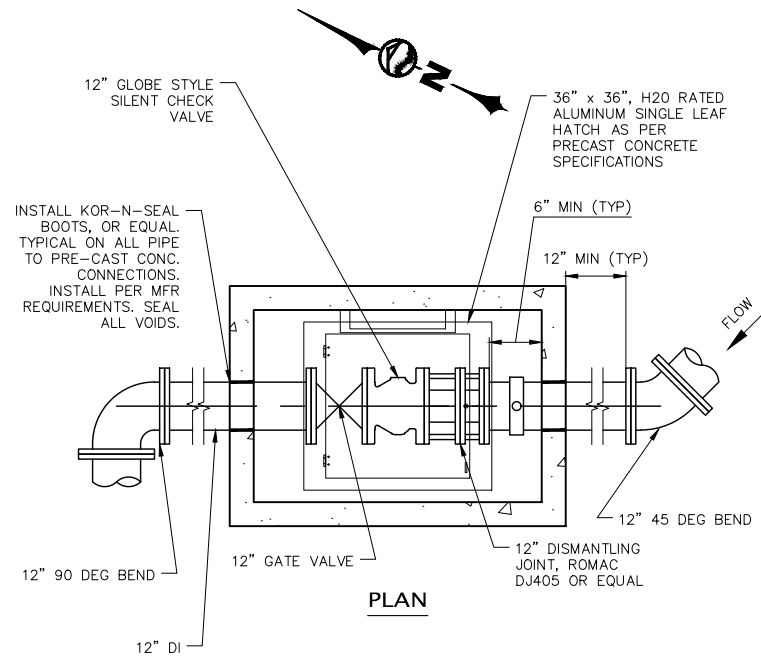
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1 C4.4
FLOW METER VALVE VAULT DETAIL
NOT TO SCALE



2 C4.4
OUTLET VALVE VAULT WITH SEISMIC VALVE DETAIL
NOT TO SCALE

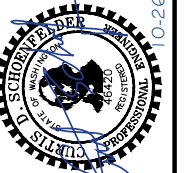


3 C4.4
OUTLET VALVE VAULT
NOT TO SCALE

SHEET NOTE:
1. ALL THREE VAULTS SHALL HAVE INTRUSION SWITCHES AND ALARMS. COORDINATE WITH ELECTRICAL AND CONTROL DRAWINGS.



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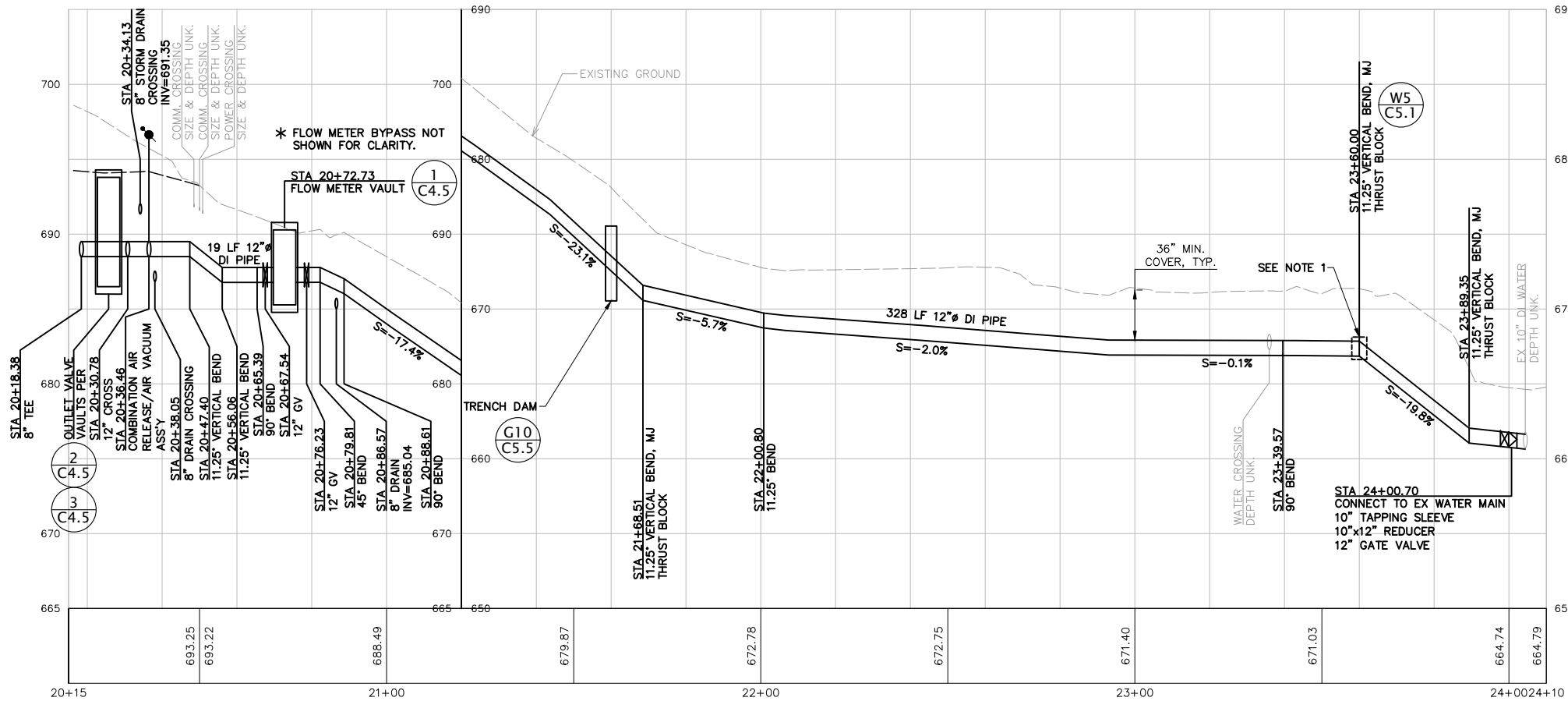


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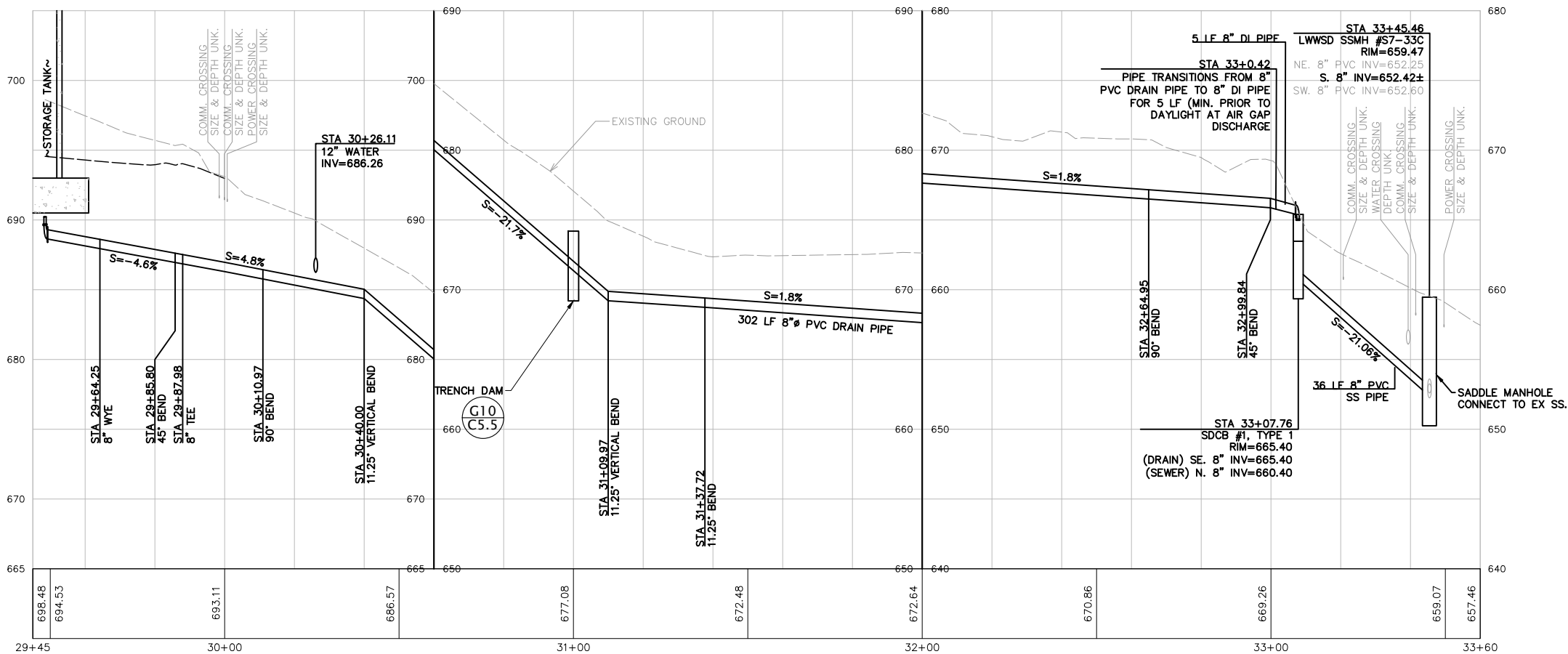
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WASHINGTON
DIVISION 7 RESERVOIR REPLACEMENT PROJECT
WHATCOM COUNTY
WATER VAULTS - PLANS AND SECTIONS

SHEET **C4.5**
DATE 10-11-2023
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JOB NUMBER 2021-130
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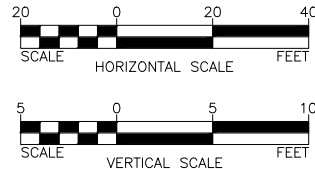


WATER PROFILE



OVERFLOW/DRAIN PROFILE

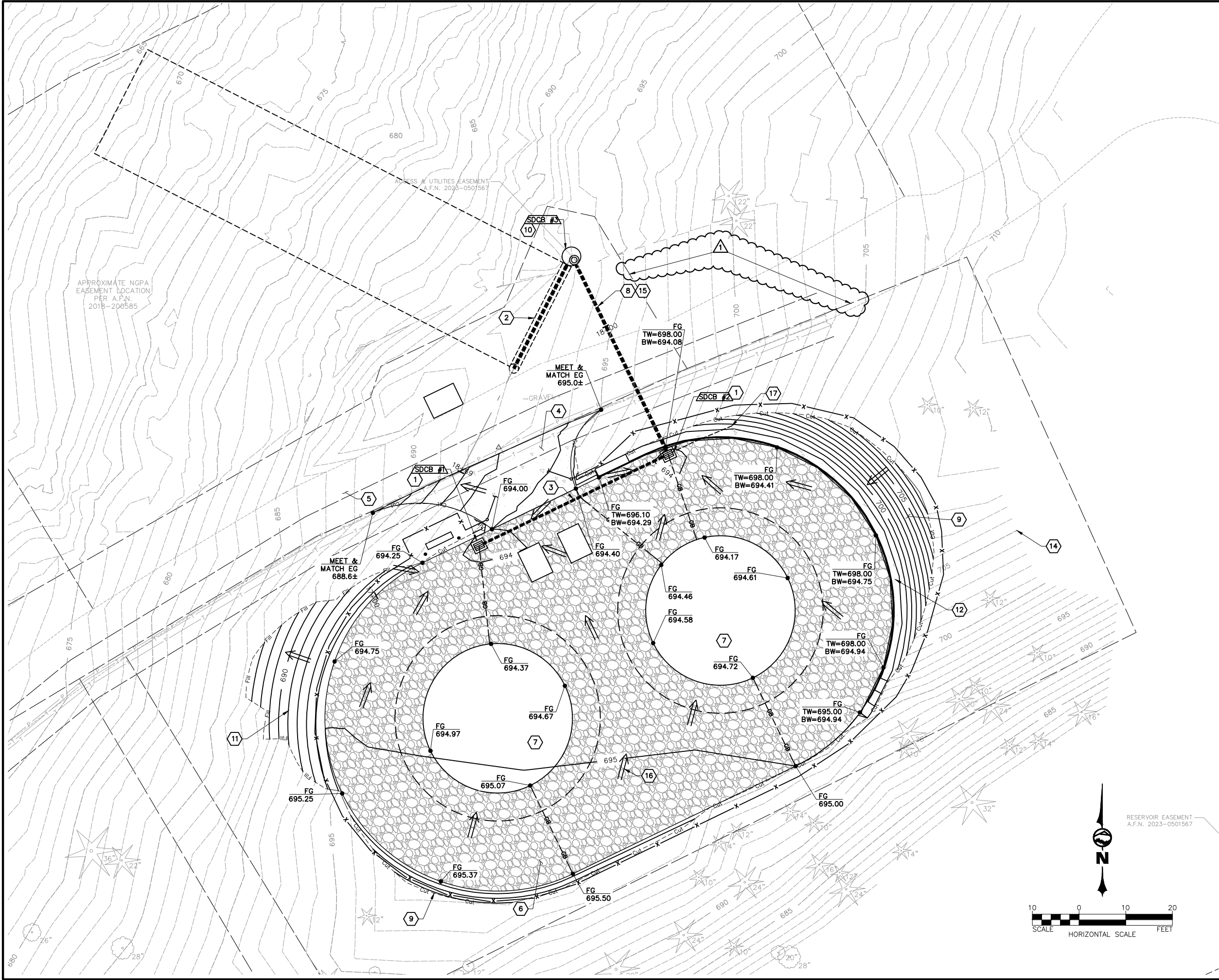
- NOTES:
1. IF ROCK PREVENTS INSTALLATION OF CONVEX THRUST BLOCKING, INSTALL MEGA-LUG RESTRAINTS AND RESTRAINED JOINTS ONE JOINT OR MIN. 14 LF EACH WAY OF FITTING.
 2. MINIMUM SLOPE REQUIRED FOR 8" DRAIN PIPE IS 1.2%. FOR THIS PROJECT ANY REQUIRED DEVIATIONS FROM THE DESIGN SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.



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WATER, OVERFLOW AND DRAIN PROFILE	
DATE 10-11-2023	SCALE AS SHOWN
SHEET C4.6	JOB NUMBER 2021-130
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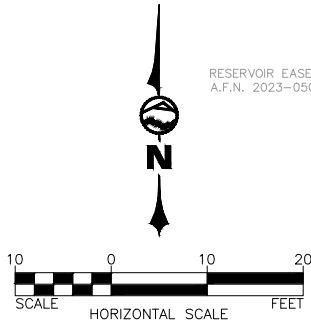
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ABBREVIATIONS:
BW = BOTTOM OF WALL
TW = TOP OF WALL

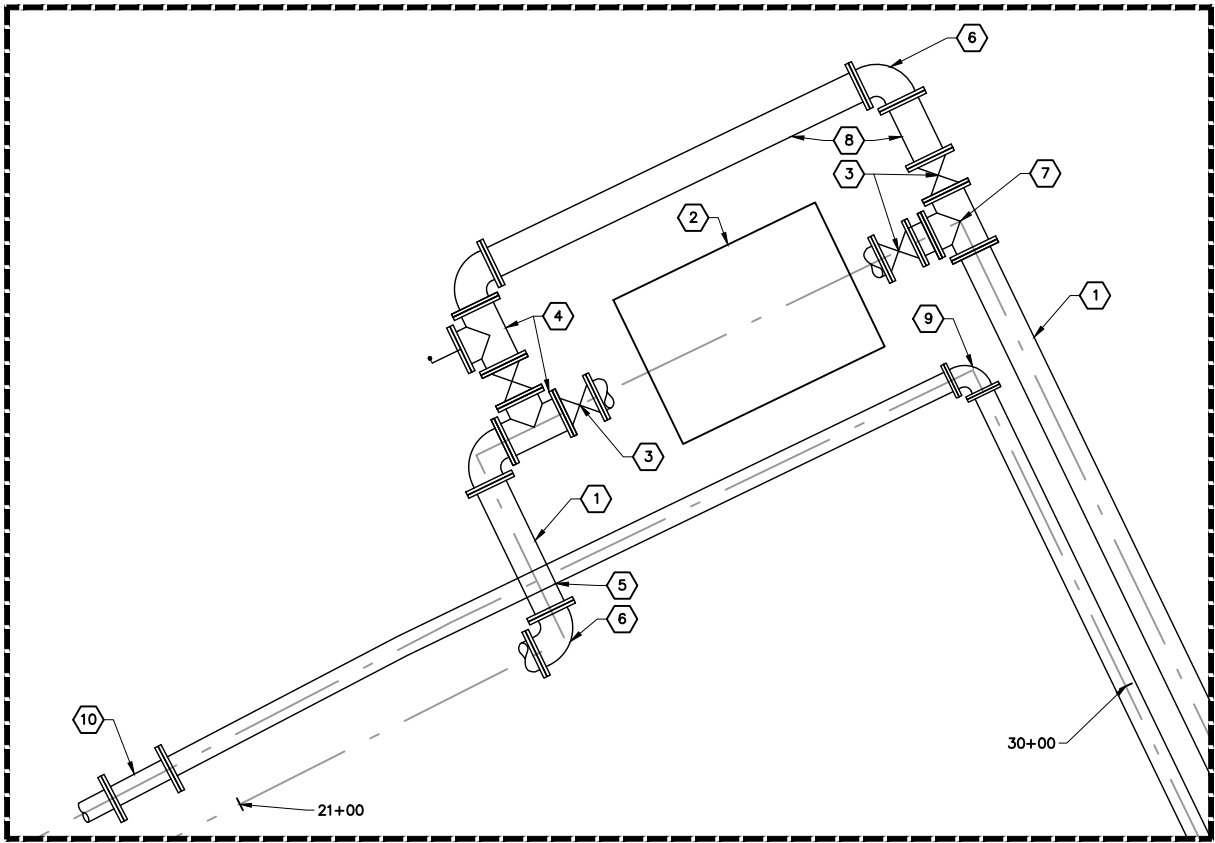
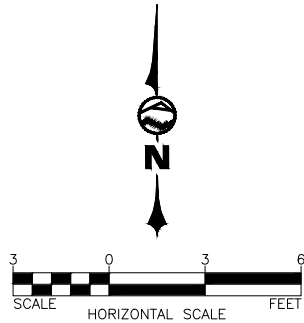
- KEYED NOTES**
- 1 = TYPE 1 CATCH BASIN (1 C5.4)
 - 2 = 26 LF DISPERSION TRENCH (2 C5.4)
 - 3 = 6" PVC STORM DRAIN
 - 4 = CEMENT CONCRETE APRON W/ ROUGH BROOM FINISH (2 C5.5)
 - 5 = EXISTING ROAD RUNOFF FLOWS AS SHEET FLOW TO A FULL DISPERSION AREA TO NORTH.
 - 6 = GRAVEL SUFACING, TYP.
 - 7 = CONCRETE WATER RESERVOIR
 - 8 = 8" DIA. PVC STORM DRAIN
 - 9 = PROPOSED CUT AREA
 - 10 = TYPE 2 CATCH BASIN (3 C5.4)
 - 11 = PROPOSED FILL AREA TO BE RESTORED PER TYPICAL FOREST RESTORATION PLANTING DETAIL (1 C4.9)
 - 12 = GRAVITY BLOCK WALL, MAX HEIGHT 4-FT, PER (1 C5.6)
 - 13 = NOT USED
 - 14 = TOPOGRAPHIC SURVEY LIMITS
 - 15 = STORM ALIGNMENT STORM PROFILE PER (A C4.8)
 - 16 = SURFACE FLOW DIRECTION
 - 17 = WALL DRAIN, DRAIN 2% SLOPE TO CATCH BASIN.



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DATE 10-17-2023	SCALE AS SHOWN
SHEET C4.7	JOB NUMBER 2021-130
PAGE 16	OF 50
GRADING AND DRAINAGE PLAN	

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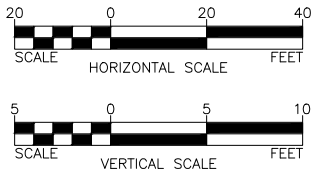
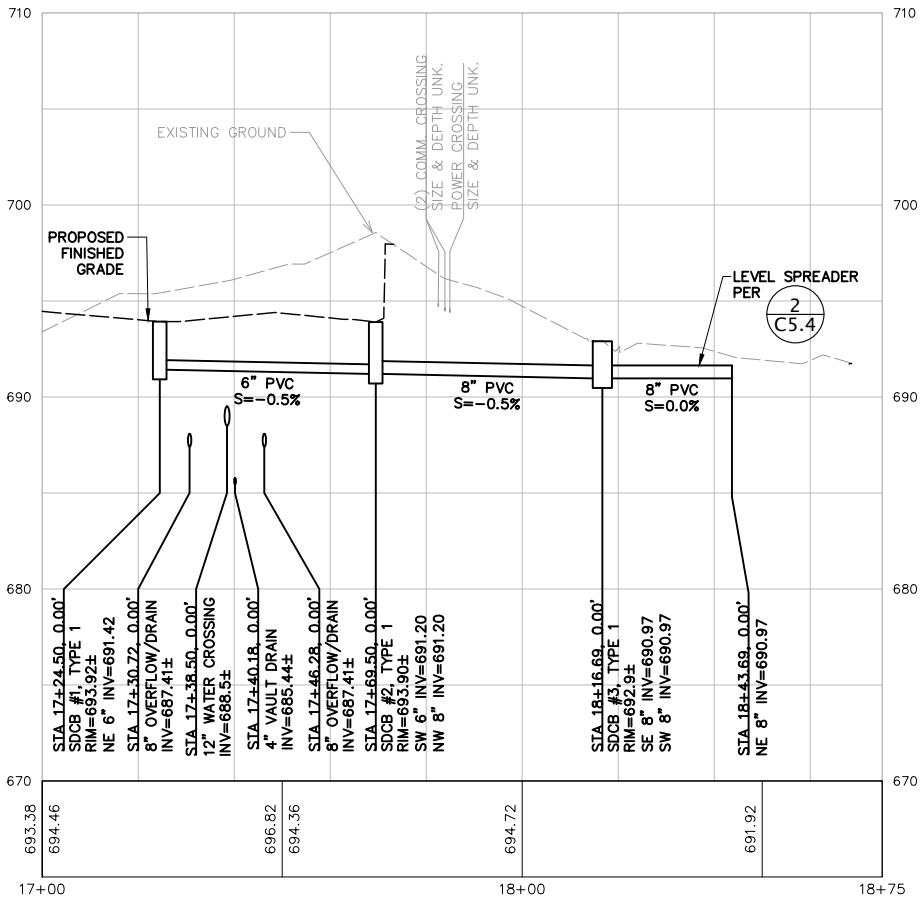


- KEYED WATER NOTES**
- 1 = WATER MAIN, 12" DI INLET/OUTLET
 - 2 = FLOW METER VAULT PER $\frac{1}{C4.5}$
 - 3 = 12" GATE VALVE, FLxMJ, & BOX PER $\frac{1}{C5.2}$
 - 4 = 2-12" TEE, FL
2-12" 90 DEG BEND, FLxMJ
1-12" GV, FL
2" BLOWOFF ASSY PER $\frac{W7}{C5.1}$
 - 5 = 12" MIN. SEPARATION BETWEEN WATER AND DRAIN LINES, BACKFILL w/CDF
 - 6 = 12" 90 DEG BEND, MJxMJ, T.B.
 - 7 = 12" TEE, FL
12" FLxMJ ADAPTER W/MEGA-LUG RESTRAINT
 - 8 = 12" DI METER VAULT BYPASS PIPING

- KEYED OVERFLOW & DRAINAGE NOTES**
- 9 = 8" 90 DEG BEND, T.B.
 - 10 = 8" 11.25 DEG VERTICAL BEND, T.B.

C4.4

RESERVOIR SITE PLAN DETAIL



A
C4.7

STORM DRAIN PROFILE

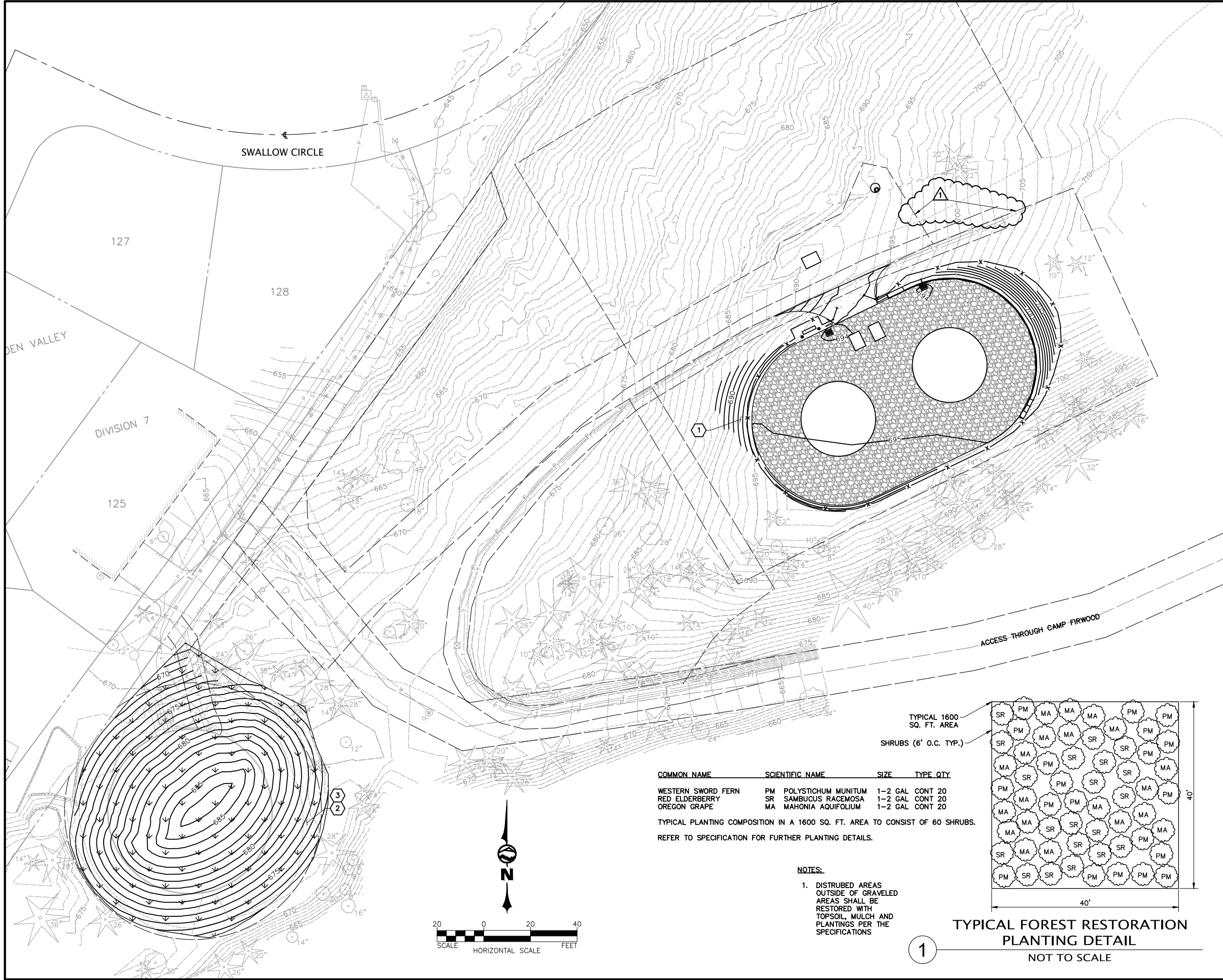


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	PAGE 17 OF 50	DIVISION 7 RESERVOIR REPLACEMENT PROJECT		
JOB NUMBER 2021-130		STORMWATER PLAN & PROFILE AND RESERVOIR SITE PLAN DETAIL		

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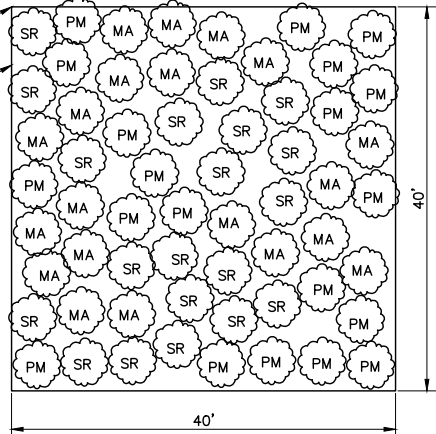
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RED ELDERBERRY	SR SAMBUCUS RACEMOSA	1-2 GAL	CONT	20
OREGON GRAPE	MA MAHONIA AQUIFOLIUM	1-2 GAL	CONT	20

TYPICAL PLANTING COMPOSITION IN A 1600 SQ. FT. AREA TO CONSIST OF 60 SHRUBS.
REFER TO SPECIFICATION FOR FURTHER PLANTING DETAILS.

NOTES:

1. DISTURBED AREAS OUTSIDE OF GRAVELED AREAS SHALL BE RESTORED WITH TOPSOIL, MULCH AND PLANTINGS PER THE SPECIFICATIONS

TYPICAL 1600
SQ. FT. AREA
SHRUBS (6' O.C. TYP.)



TYPICAL FOREST RESTORATION
PLANTING DETAIL
NOT TO SCALE

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KEYED NOTES

- 1 = FILL AREA TO BE RESTORED WITH NATIVE VEGETATION PER
- 2 = EXISTING TANK AREA TO BE RESTORED WITH NATIVE VEGETATION AFTER DEMOLITION PER
- 3 = SITE PLAN AT THE EXISTING TANK SITE REPRESENTS FINAL GRADE IF CONTRACTOR ELECTS TO USE THE PROJECTS DESIGNATED TEMPORARY STOCKPILE LOCATIONS. SEE ALTERNATE FINISHED GRADE PROFILE ON

SHEET NOTES:

- 1) SEE SHEET C1.1 FOR COMPLETE EXISTING CONDITIONS



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EJH/LMH

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LAKE WHATCOM WATER AND SEWER DISTRICT

WHATCOM COUNTY

DIVISION 7 RESERVOIR REPLACEMENT PROJECT

RESTORATION PLAN

DATE
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2021-130

SHEET
C4.9

PAGE
18

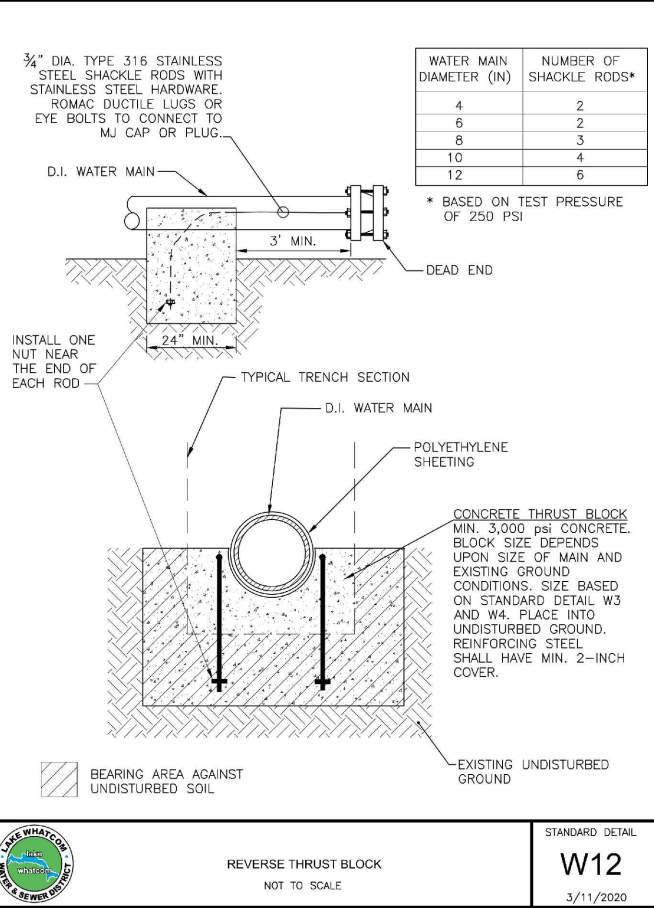
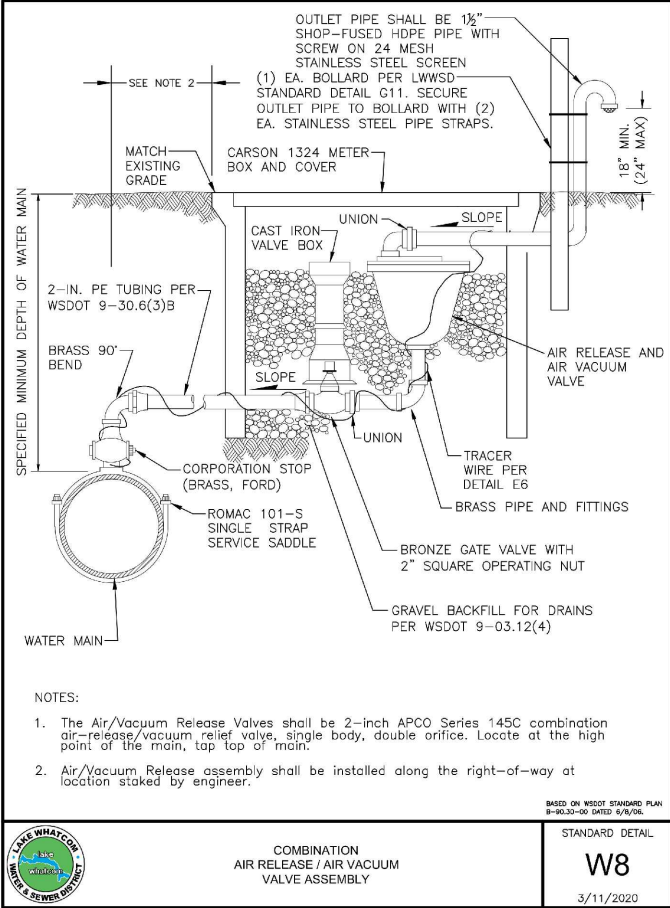
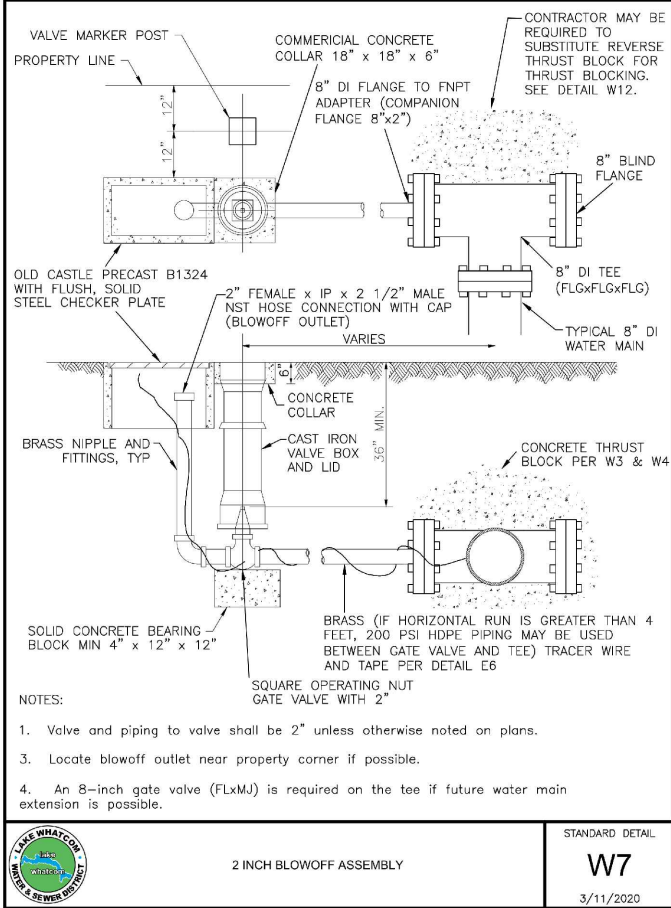
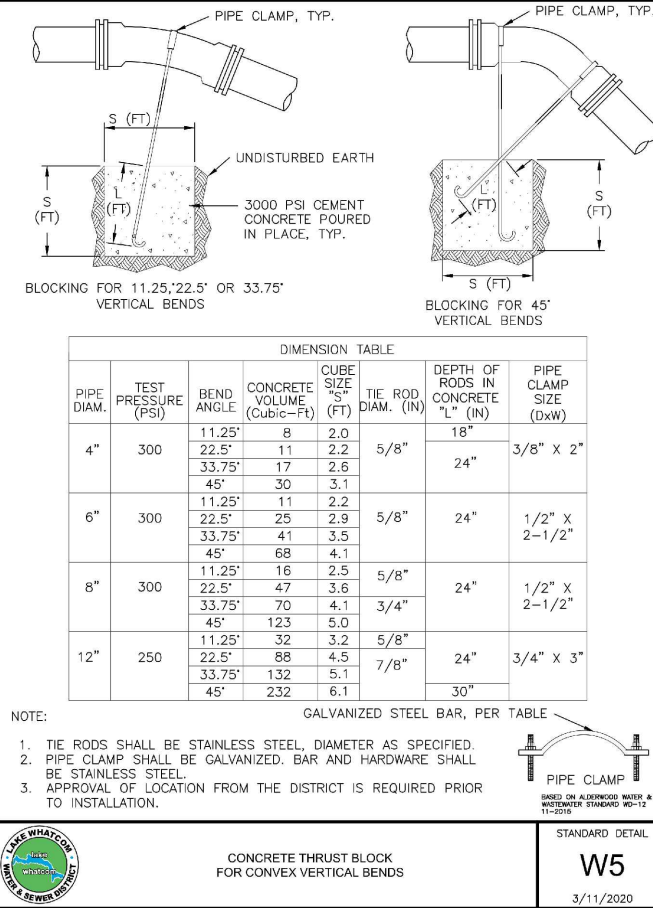
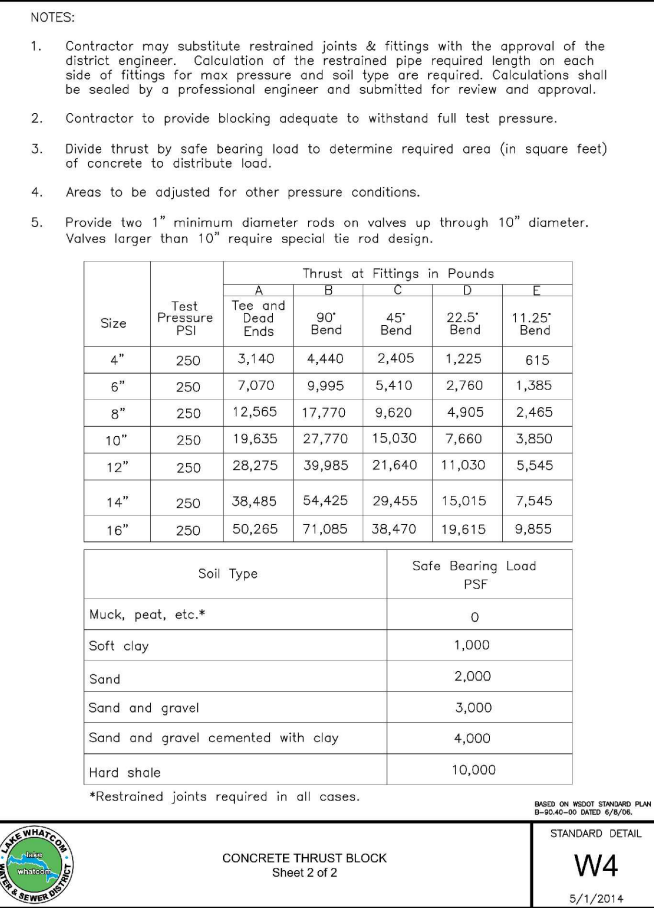
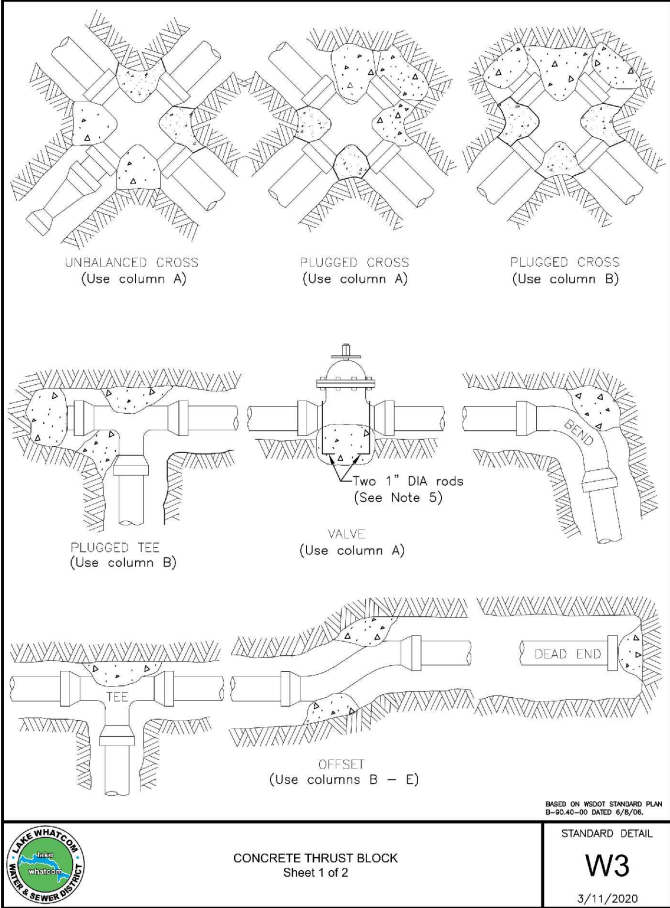
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MMM

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2021-130

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OF 50

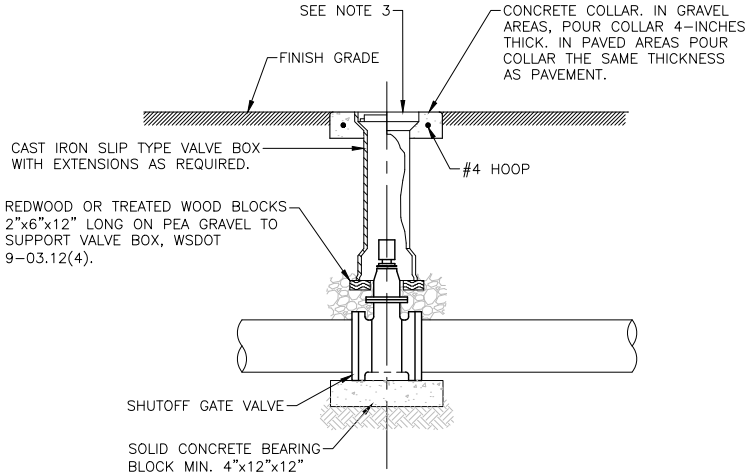
LAKE WHATCOM WATER AND SEWER DISTRICT

WASHINGTON

DIVISION 7 RESERVOIR REPLACEMENT PROJECT

WATER DETAILS

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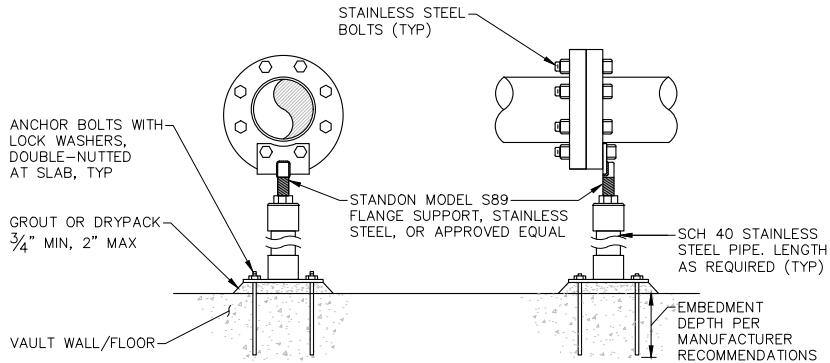
NOTES:

1. FOR SURFACE RESTORATION AND TYPICAL TRENCH DETAIL SEE LWSD STD DET G4.
2. WSDOT REFERENCE PER LATEST EDITION.
3. LOCKING VALVE BOX LIDS, TRUMBULL OR EQUAL, SHALL BE INSTALLED WHERE IDENTIFIED ON PLAN.

1

BURIED GATE VALVE DETAIL

NOT TO SCALE



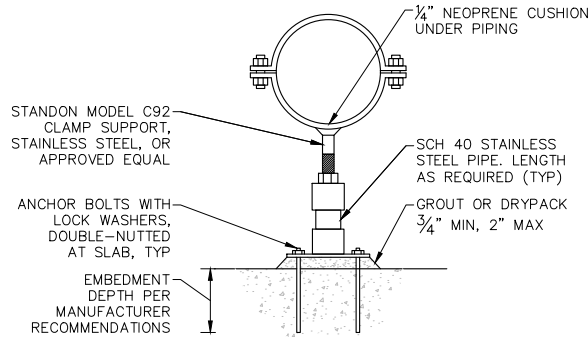
NOTES:

1. TO INSURE PROPER SUPPORT AND STABILITY, AFTER FINAL HEIGHT ADJUSTMENT IS ATTAINED, APPLY TACK WELDS TO BOTH SUPPORT CUPS AND EXTENSION PIPE. USE E70XX ELECTRODE FOR WELDS.
2. BOLTS & ANCHOR BOLTS SHALL BE TYPE 316 STAINLESS STEEL. ALL OTHER PARTS TO BE TYPE 304 STAINLESS STEEL.

2

PIPE SUPPORT, FLANGE TYPE

NOT TO SCALE



NOTES:

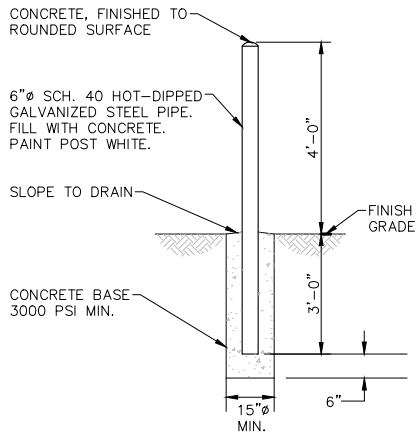
1. TO INSURE PROPER SUPPORT AND STABILITY, AFTER FINAL HEIGHT ADJUSTMENT IS ATTAINED, APPLY TACK WELDS TO BOTH SUPPORT CUPS AND EXTENSION PIPE. USE E70XX ELECTRODE FOR WELDS.
2. BOLTS & ANCHOR BOLTS SHALL BE TYPE 316 STAINLESS STEEL. ALL OTHER PARTS TO BE TYPE 304 STAINLESS STEEL.

3

PIPE SUPPORT, SADDLE TYPE

NOT TO SCALE

SADDLE SIZE	1/2"x2"
THREADED STUD	1"x6"
CUP ID	2 1/2"
1/4" BASE PLAT	8"x8"
EXTENSION PIPE DIA	2"



NOTES:

1. INSTALL POST SO THAT IT IS VERTICAL AND FIRMLY EMBEDDED.
2. CONFIRM ALL FINAL LOCATIONS W/ OWNER PRIOR TO INSTALLATION.

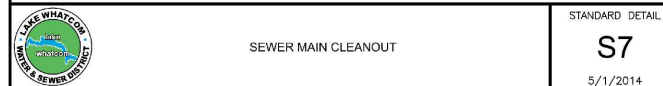
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BOLLARD

NOT TO SCALE



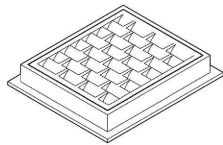
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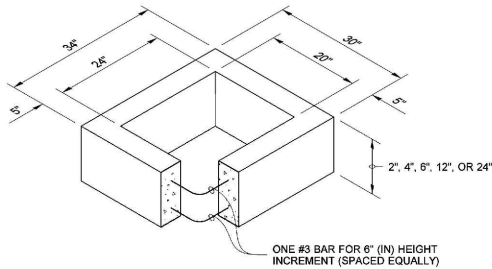
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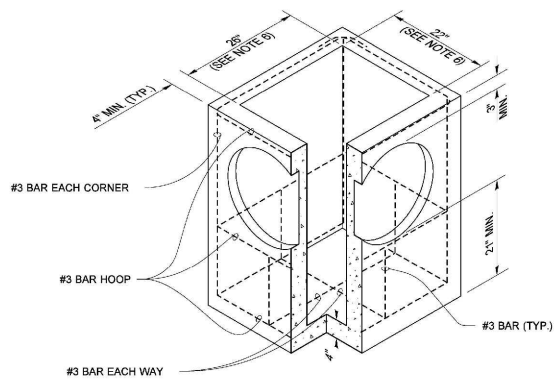
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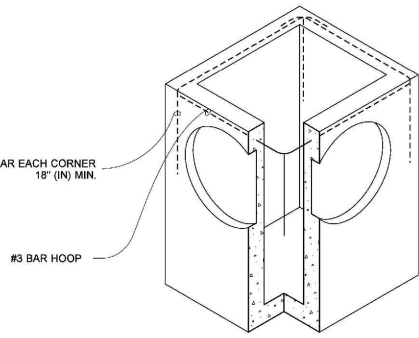
FRAME AND VANED GRATE



RECTANGULAR ADJUSTMENT SECTION



PRECAST BASE SECTION



ALTERNATIVE PRECAST BASE SECTION

PIPE ALLOWANCES	
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER (INCHES)
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP ★ (STD. SPEC. SECT. 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. SECT. 9-05.12(1))	15"
PROFILE WALL PVC (STD. SPEC. SECT. 9-05.12(2))	15"

★ CORRUGATED POLYETHYLENE STORM SEWER PIPE

NOTES

- As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.
- The knockout diameter shall not be greater than 20" (in). Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.
- The maximum depth from the finished grade to the lowest pipe invert shall be 5' (ft).
- The frame and grate may be installed with the flange down, or integrally cast into the adjustment section with flange up.
- The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1 : 24 or steeper.
- The opening shall be measured at the top of the **Precast Base Section**.
- All pickup holes shall be grouted full after the basin has been placed.



Julie Heilman
2020.09.01 07:52:50 -0700

CATCH BASIN TYPE 1

STANDARD PLAN B-5.20-03

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Roark, Steve

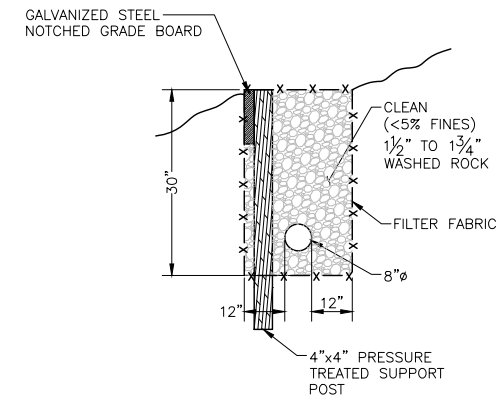
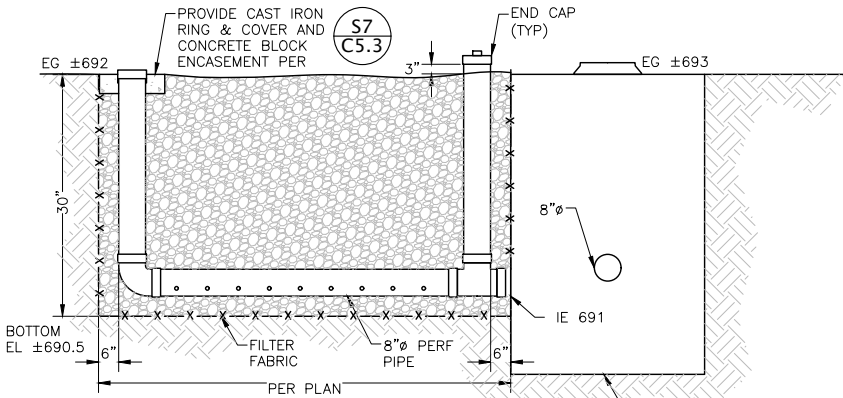
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Date: 2020.09.09 09:45:23 -0700

STATE DESIGN ENGINEER

Washington State Department of Transportation

1

DRAWN BY: EERN LIDDELL



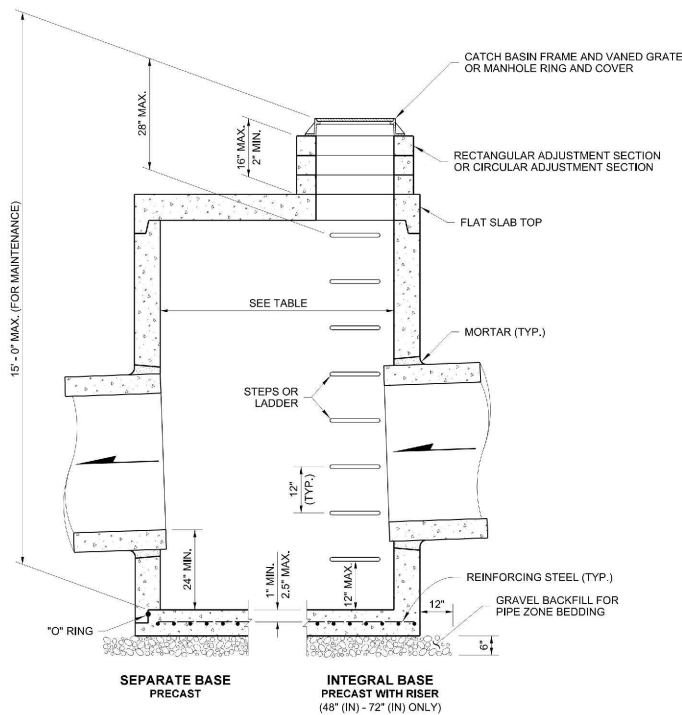
NOTES:

- TRENCH SHALL BE CONSTRUCTED SO AS TO PREVENT POINT DISCHARGE AND/OR EROSION.
- TRENCH AND GRADE BOARD MUST BE LEVEL. ALIGN TO FOLLOW CONTOURS OF SITE.
- SUPPORT POST SPACING AS REQUIRED BY SOIL CONDITIONS TO ENSURE GRADE BOARD REMAINS LEVEL.
- LEVEL SPREADER TO BE FED FROM END IF CENTER CONNECTION IN CONFLICT.
- ALL METAL BOLTS & FASTENERS TO BE STAINLESS STEEL.

LEVEL SPREADER DISPERSION TRENCH

NOT TO SCALE

2



CATCH BASIN DIMENSIONS				
CATCH BASIN DIAMETER	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	96"	12"
144"	12"	12"	108"	12"

PIPE ALLOWANCES					
CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER				
	CONCRETE	ALL METAL	CPSSP PP ①	SOLID WALL PVC ②	PROFILE WALL PVC ③
48"	24"	30"	24"	30"	30"
54"	30"	36"	30"	36"	36"
60"	36"	42"	36"	42"	42"
72"	42"	54"	42"	48"	48"
84"	54"	60"	54"	48"	48"
96"	60"	72"	60"	48"	48"
120"	66"	84"	60"	48"	48"
144"	78"	96"	60"	48"	48"

- ① Corrugated Polyethylene Storm Sewer Pipe (See **Standard Specification Section 9-05.20**)
② (See **Standard Specification Section 9-05.12(1)**)
③ (See **Standard Specification Section 9-05.12(2)**)
④ Polypropylene Pipe (See **Standard Specification Section 9-05.24**)

NOTES

- No steps are required when height is 4' or less.
- The bottom of the precast catch basin may be sloped to facilitate cleaning.
- The rectangular frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
- Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.



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Heilman, Julie
Feb 20 2018 12:49 PM

CATCH BASIN TYPE 2

STANDARD PLAN B-10.20-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Digitally signed by Heilman, Julie
Date: 2018.02.20 12:49:00 AM

STATE DESIGN ENGINEER

Washington State Department of Transportation

3



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DESIGNED BY CDS
DRAWN BY EJM/LMH
CHECKED BY MMM

DATE

10-11-2023

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JOB NUMBER

2021-130

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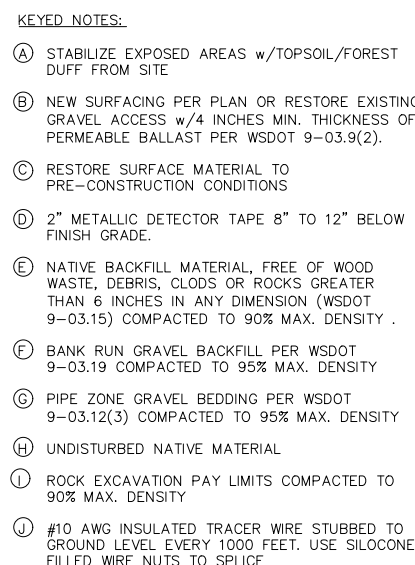
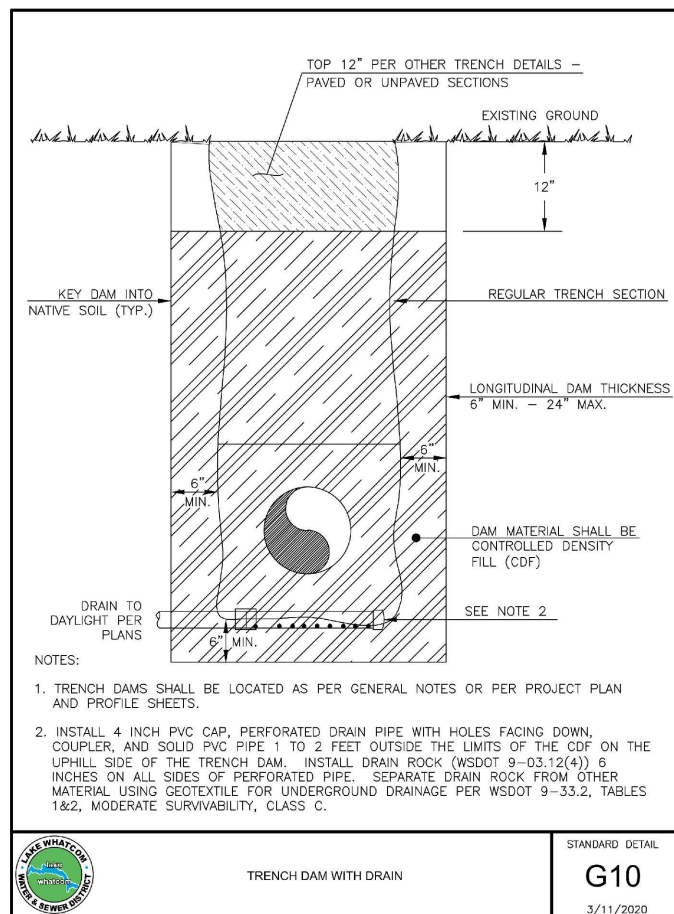
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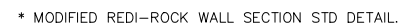
LAKE WHATCOM WATER AND SEWER DISTRICT

WASHINGTON

DIVISION 7 RESERVOIR REPLACEMENT PROJECT

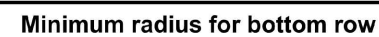
STORMWATER DETAILS





①

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* Distance between blocks is measured at the back of 28" (710 mm) blocks and 24" (610 mm) behind the form parting line (back edge of face texture) for 41" (1030 mm) blocks. This distance is intended to be a guide only. Minimum radius is controlling.

28" Top View

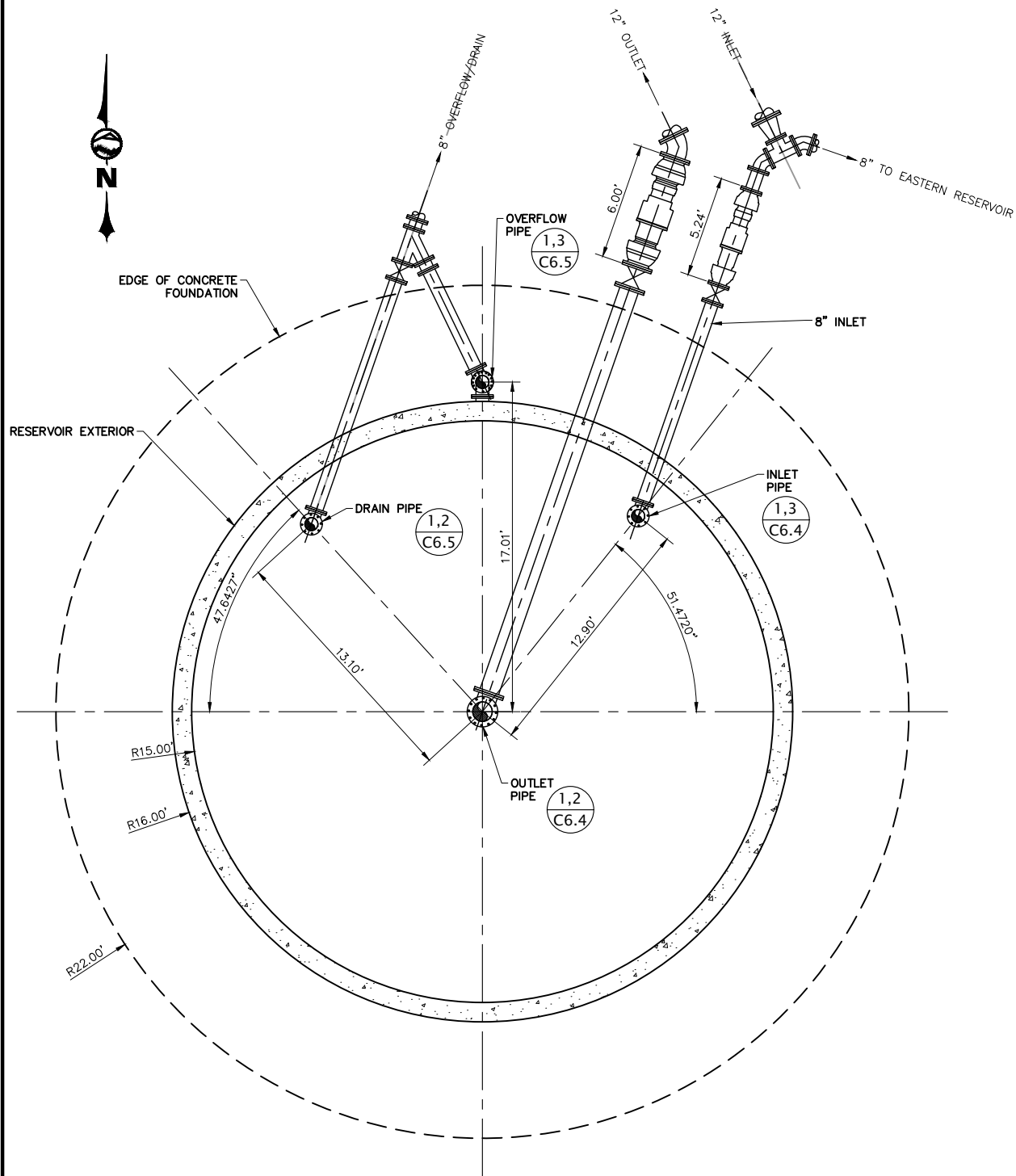
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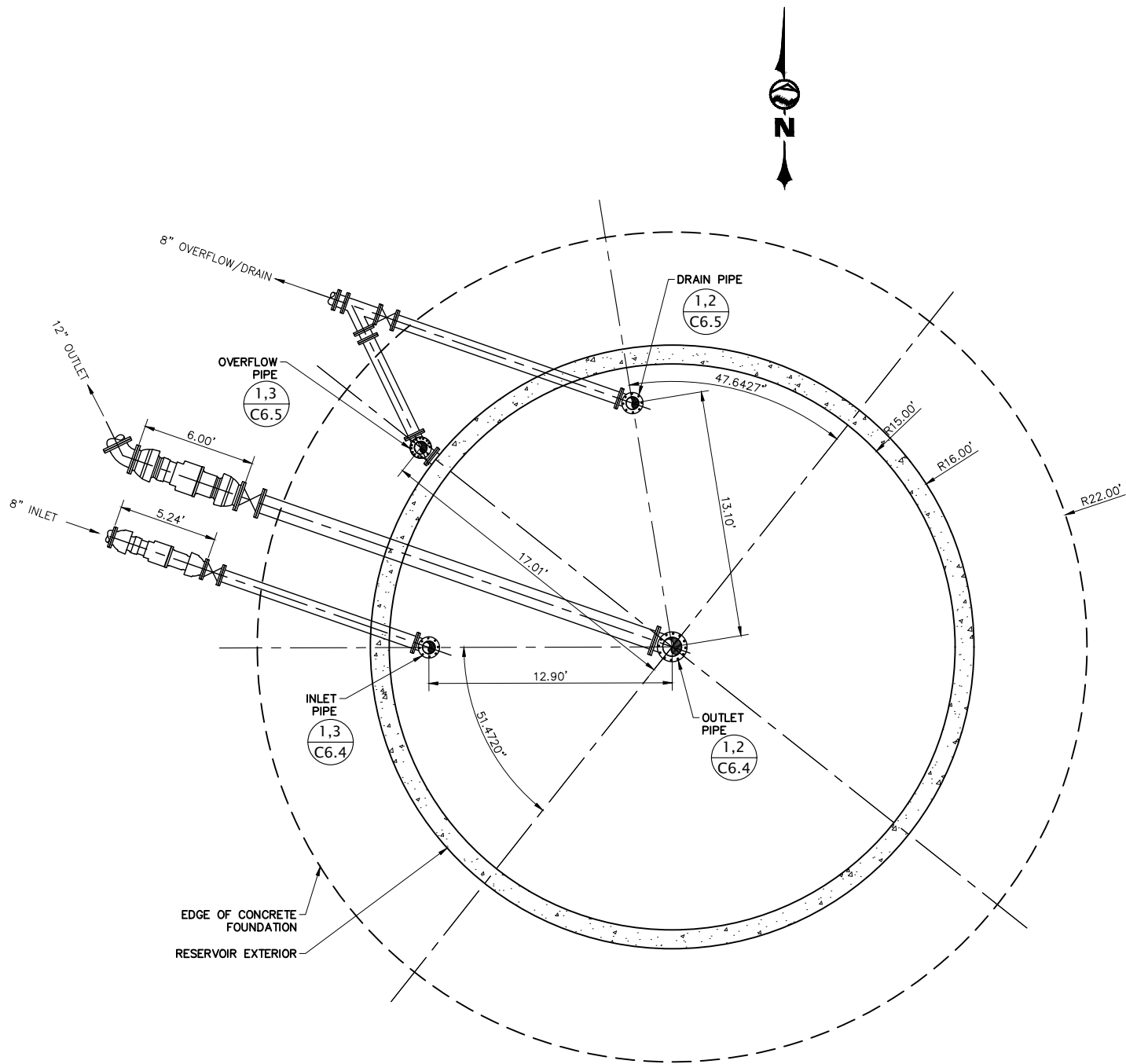
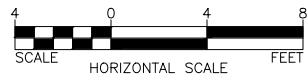
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two business days
before you dig

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1 TANK FLOOR PLAN: WESTERN TANK



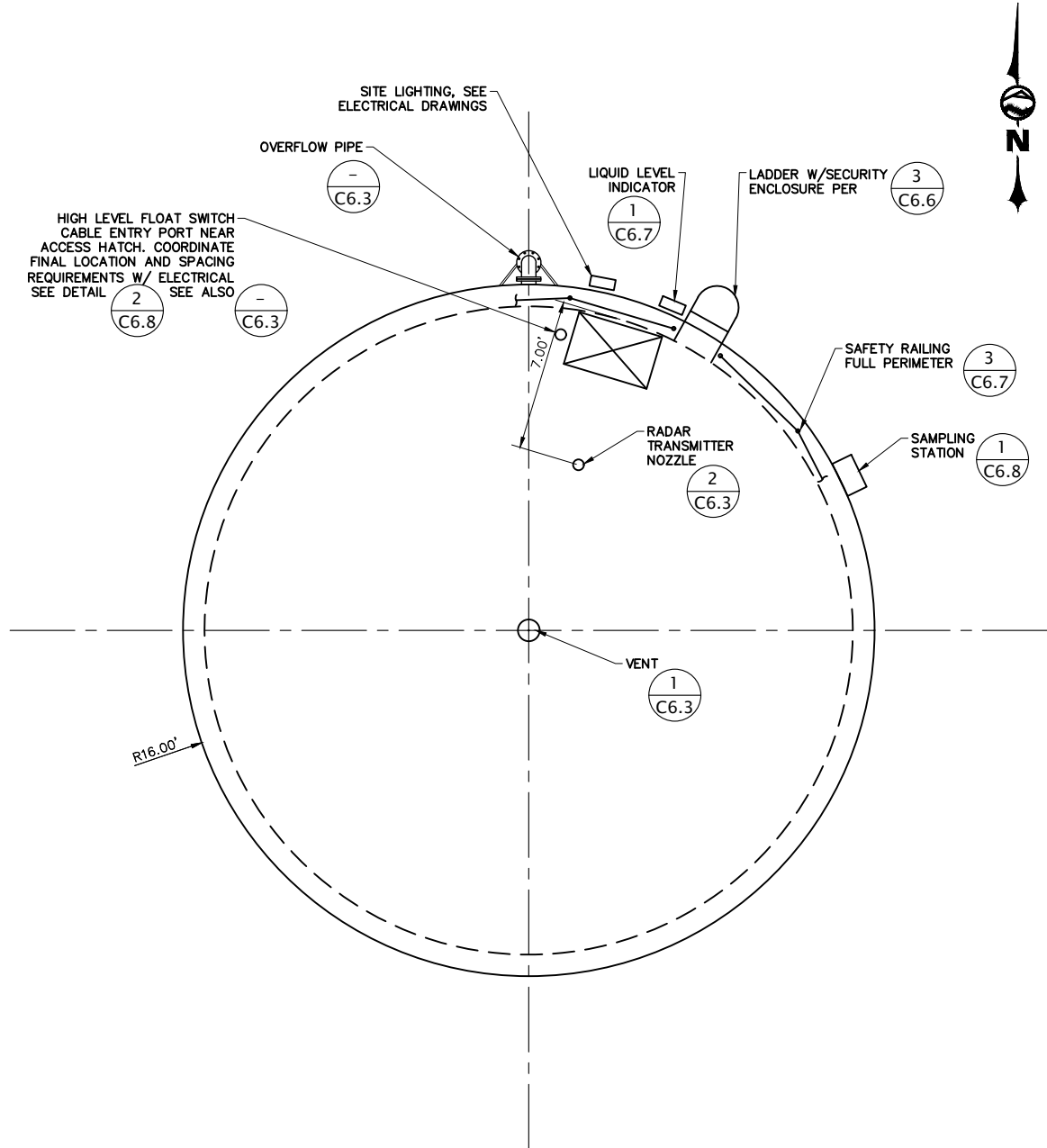
2 TANK FLOOR PLAN: EASTERN TANK



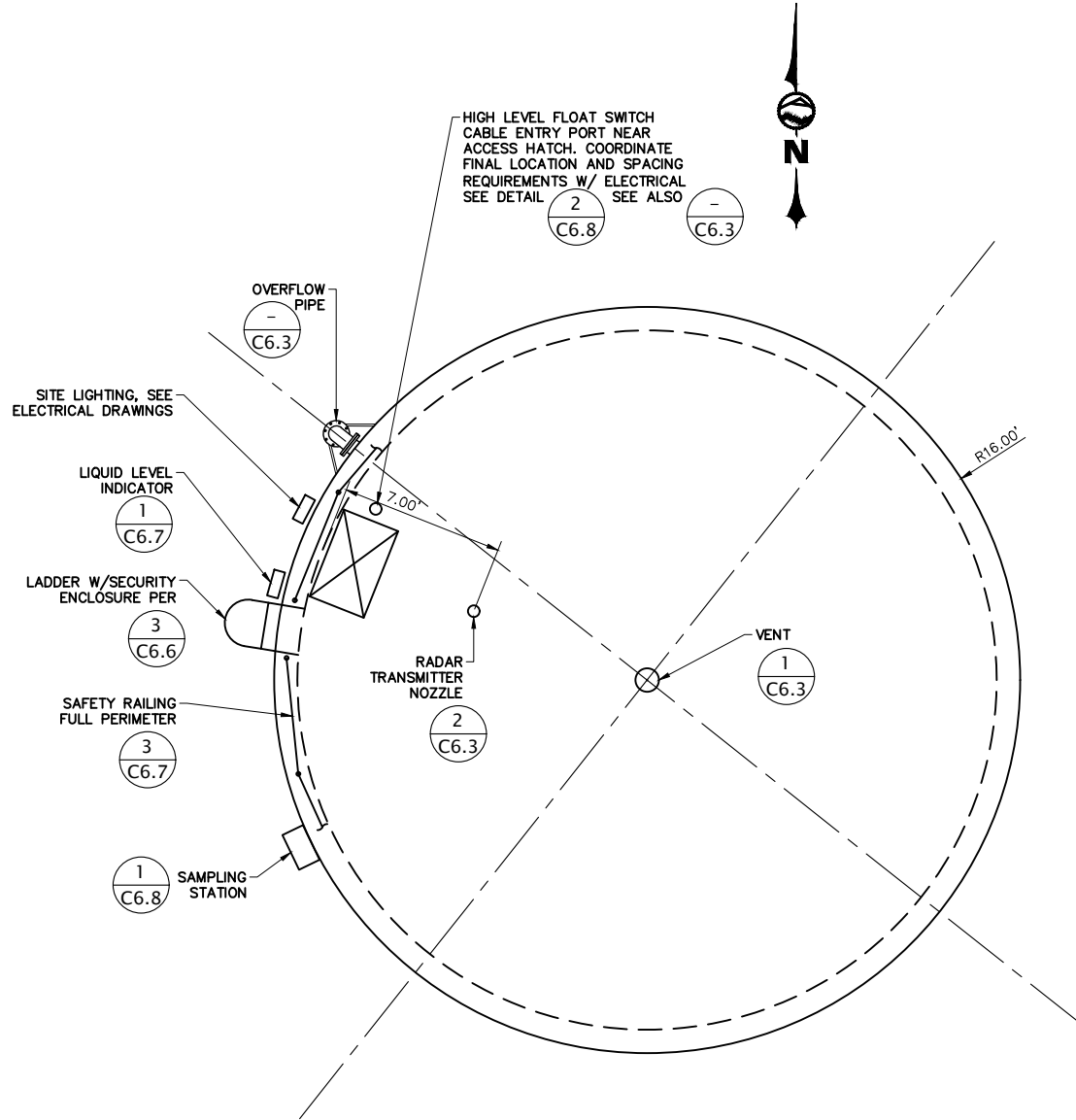
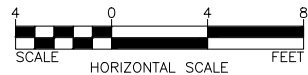
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	SCALE AS SHOWN	WHATCOM COUNTY	WASHINGTON	DRAWN BY EJH/LMH	
PAGE 25 OF 50	JOB NUMBER 2021-130	DIVISION 7 RESERVOIR REPLACEMENT PROJECT			CHECKED BY MMM
		RESERVOIR FLOOR PLAN			
		WILSON ENGINEERING			WILSONENGINEERING.COM
		10-26-2023			

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1 TANK ROOF PLAN: WESTERN TANK



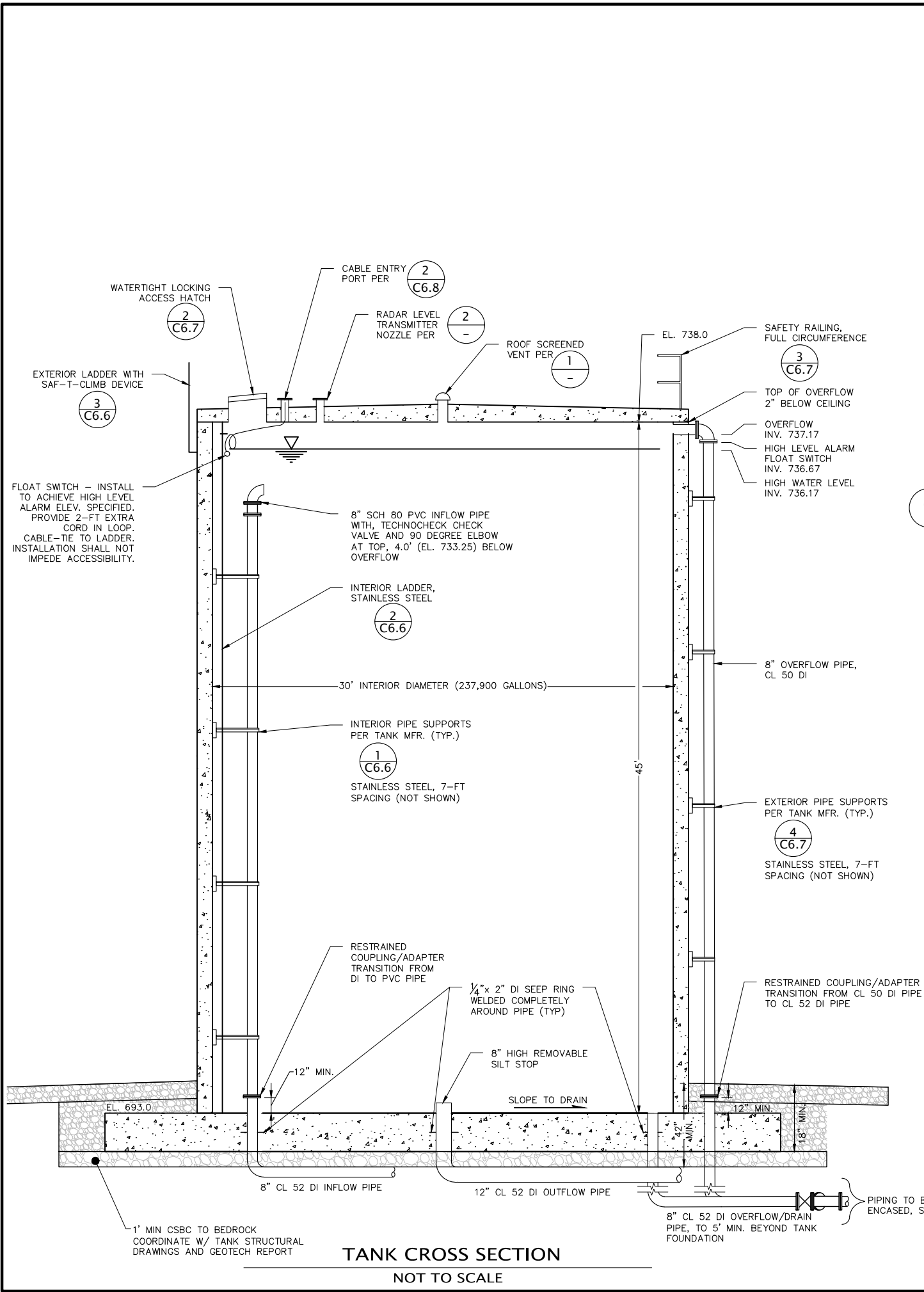
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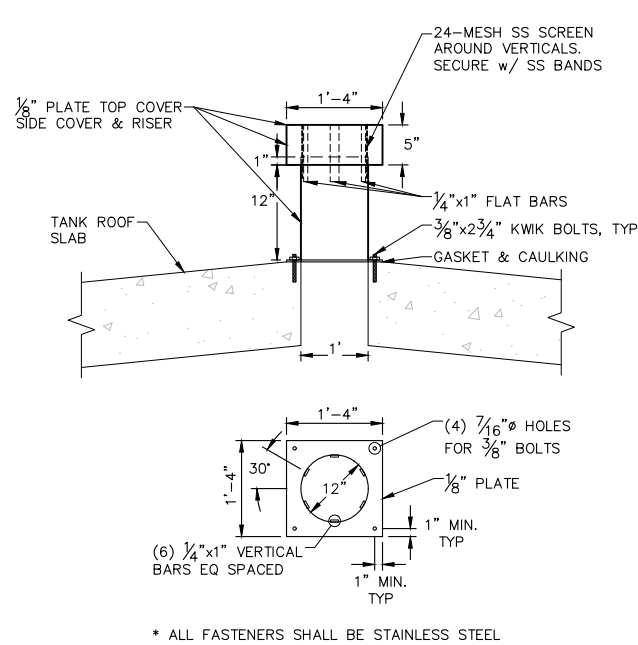
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		JOB NUMBER	RESERVOIR ROOF PLAN		
		2021-130			
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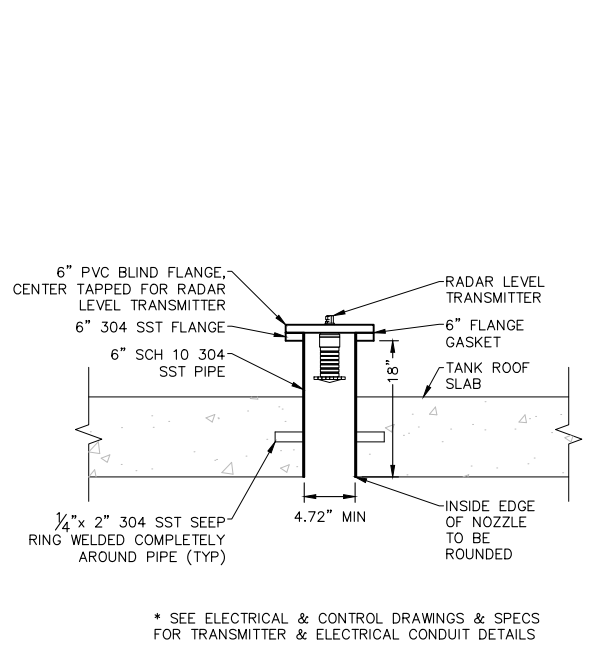
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ROOF SCREENED VENT DETAIL
NOT TO SCALE



2

RADAR TRANSMITTER NOZZLE DETAIL
NOT TO SCALE



STORAGE TANK NOTES

- CONSTRUCTION PROCEDURES - ALL WORK AND MATERIALS SHALL CONFORM WITH THE LATEST EDITION OF THE WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION.
- THE TANKS SHALL BE 30.0 FEET INSIDE DIAMETER BY 45.0 FEET HIGH (239,700 GALLONS EACH GROSS) AND SHALL BE CONSTRUCTED AT THE LOCATION SHOWN ON THE PLANS. STRUCTURAL DRAWINGS, SEALED BY A PROFESSIONAL ENGINEER, SHALL BE REQUIRED FROM THE CONTRACTOR. THE DESIGN OF THE TANK SHALL BE IN ACCORDANCE WITH UBC, LATEST EDITION, AND RECOMMENDED STANDARDS FOR WATERWORKS BY GREAT LAKES-UPPER MISSISSIPPI RIVER BOARD OF STATE SANITARY ENGINEERS.
- THE TANKS SHALL BE PLACED ON A LEVEL PAD STRIPPED OF VEGETATION AND GRADED TO A SIZE LARGER THAN THE TANK DIAMETER AND PER SITE GRADING. COMPACTION OF THE PAD SHALL BE PER THE TANK SUPPLIER AND GEOTECHNICAL REPORT RECOMMENDATIONS. THE AREA AROUND THE PAD SHALL BE GRADED TO ASSURE POSITIVE DRAINAGE OF RAIN RUNOFF AWAY FROM THE PAD, IN ACCORDANCE WITH GRADING PLAN.
- THE CONCRETE ROOF SLAB OF THE TANK SHALL HAVE A MINIMUM OF TWO (2) PERCENT SLOPE FROM THE APEX TO ENSURE PROPER RUNOFF. AIR VENTS SHALL BE CONSTRUCTED AT EACH LOCATION SHOWN AND AS SHOWN IN THE DETAILS. THE AIR VENTS SHALL BE CONSTRUCTED SO THAT NO FALLING PARTICLES MAY ENTER THE TANK. THE VENTS WILL BE SIZED TO SAFELY VENT THE TANK DURING PUMPING OR WITHDRAWING WATER AT A MAXIMUM RATE OF 2,400 GPM WITHOUT USING THE OVERFLOW AS A VENT.
- A ROOF ACCESS HATCH TO THE INSIDE OF THE TANK SHALL BE PROVIDED. THE ENTRY COVER SHALL BE STAINLESS STEEL, CAPABLE OF BEING SECURED SHUT BY A SEPARATE OWNER-PROVIDED LOCK, AND HAVE A HANDLE FOR LIFTING. THE ENTRY SHALL BE POURED IN PLACE WITH THE CONCRETE ROOF SLAB. THE ACCESS HATCH ENTRY SHALL HAVE A MINIMUM SIDE LENGTH OF THIRTY (30) INCHES. THE ACCESS HATCH SHALL EXTEND SIX (6) INCHES MINIMUM ABOVE THE ROOF AND BE FITTED WITH A WATERTIGHT GASKET.
- AN OVERFLOW PIPE, CL 50 DI PIPE, AND 8 INCHES IN DIAMETER SHALL BE PLACED IN THE WALL OF THE TANK IMMEDIATELY UNDER THE ROOF SLAB. THE PIPE SHALL EXTEND DOWNWARD ON THE SIDE OF THE TANK AND WYE INTO THE DRAIN PIPE.
- THE FLOOR OF THE TANK SHALL BE CONSTRUCTED WITH A SLOPE OF 1/4 INCH PER FOOT TO THE DRAIN CASTING LOCATED AS SHOWN ON THE PLAN.
- ALL PIPE AND FITTINGS WITHIN FIVE (5) FEET OF THE TANK SHALL BE CLASS 52 DUCTILE IRON AS NOTED ON THE PLANS. FITTINGS UNDER THE TANK AND TO A POINT 5 FEET BEYOND SHALL BE RESTRAINED JOINTS BY MECHANICAL JOINT AND MEGA-LUG, OR APPROVED EQUAL. DUCTILE IRON PIPE SHALL EXTEND THROUGH THE BOTTOM OF THE TANK TO FLOOR LEVEL.
- BEFORE BEING PLACED IN SERVICE THE TANKS SHALL BE CLEANED AND DISINFECTED IN ACCORDANCE WITH AWWA C652-86 STANDARDS.
- THE LADDER OF NON-CORROSIVE MATERIALS ON THE INSIDE SHALL EXTEND FROM THE FLOOR TO THE ROOF OF THE TANK.
- AN EXTERIOR LEVEL INDICATOR SHALL BE INSTALLED. INDICATOR SHALL BE CONSTRUCTED OF STAINLESS STEEL FLOATS, GUIDES, AND HARDWARE AND INCLUDE AN EXTERIOR GAUGE BOARD MARKED IN FEET.
- UPON PREPARATION OF SUBGRADE AND PRIOR TO POURING CONCRETE, CONTRACTOR SHALL NOTIFY OWNER AND TANK SUPPLIER FOR SUBGRADE CHECK.
- ALL COATINGS, CONCRETE FORM RELEASE AND CURING AGENTS, LINERS, OR OTHER MATERIALS, IF ANY, IN CONTACT WITH POTABLE WATER SHALL BE CERTIFIED BY NSF INTERNATIONAL OR UNDERWRITERS LABORATORIES TO MEET ANSI/NSF STANDARD 61.
- THE CL 50 DI OVERFLOW PIPE SHALL BE CEMENT MORTAR LINED INTERIOR AND EPOXY PRIMED EXTERIOR READY FOR FINAL COATING OF EPOXY PER SPECS.
- TANKS SHALL INCLUDE PENETRATIONS FOR SAMPLING STATION PIPING. SEE C6.2 FOR LOCATIONS AND C6.8 FOR DETAILS.



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LAKE WHATCOM WATER AND SEWER DISTRICT

WASHINGTON

DIVISION 7 RESERVOIR REPLACEMENT PROJECT

RESERVOIR ELEVATION AND DETAILS

DATE
10-11-2023

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JOB NUMBER
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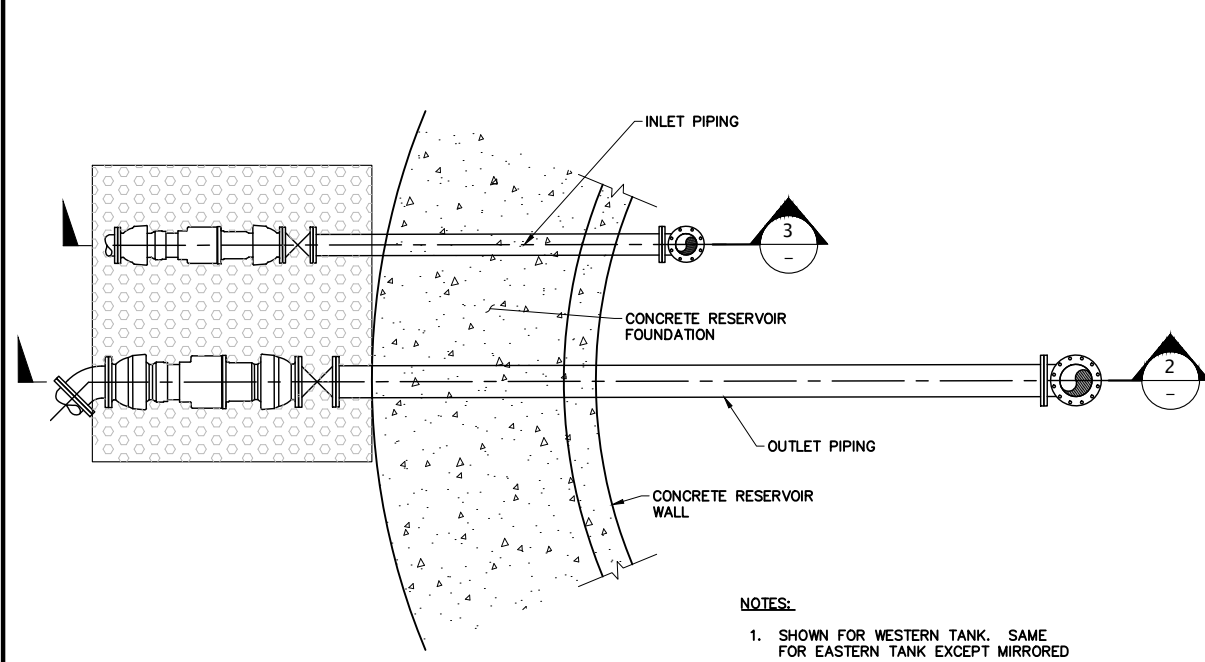
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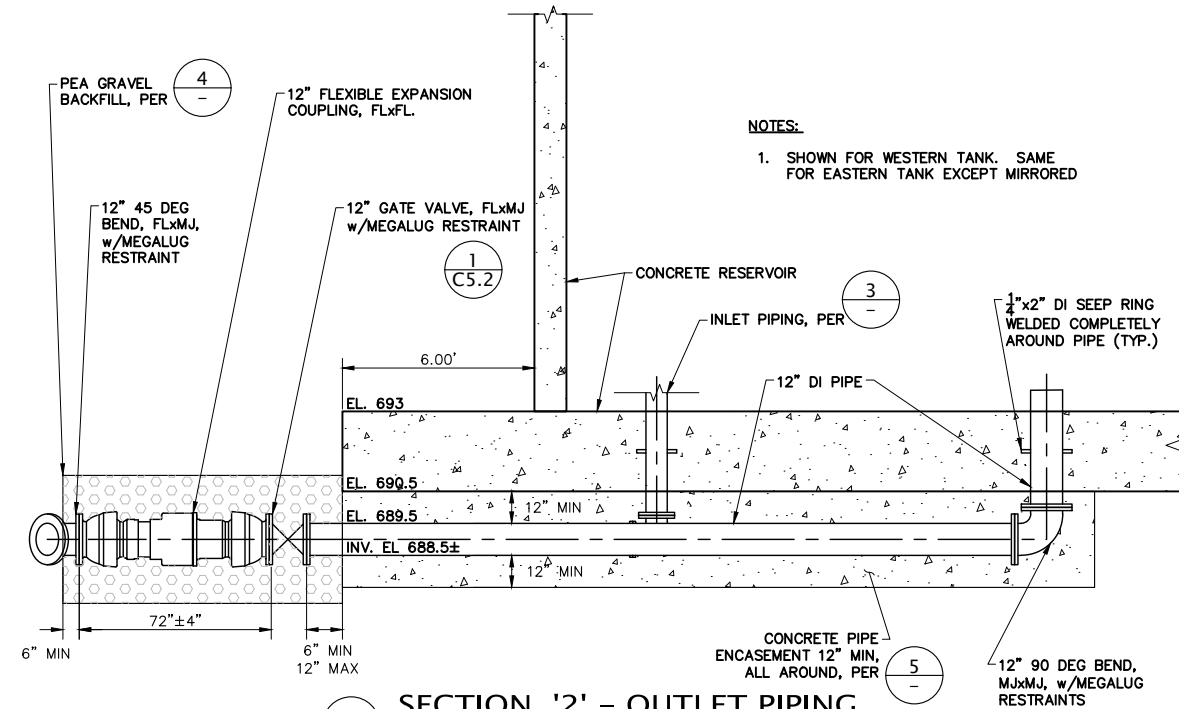
WHATCOM COUNTY

10-26-2023

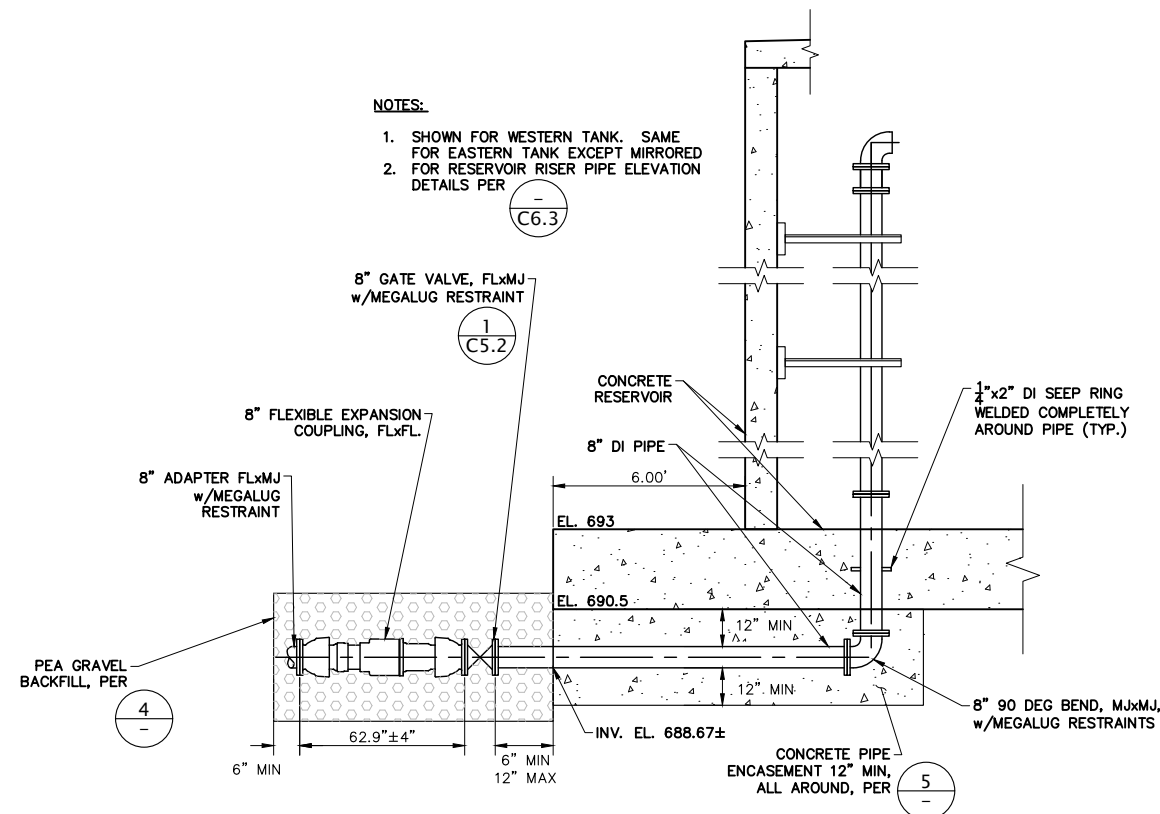
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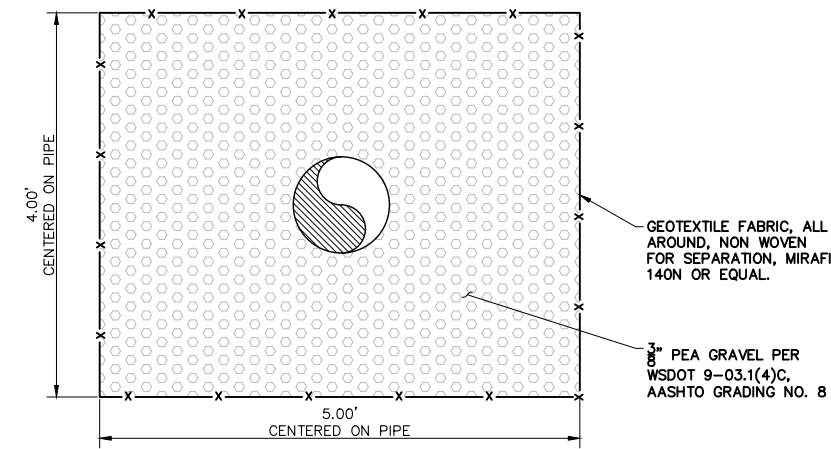
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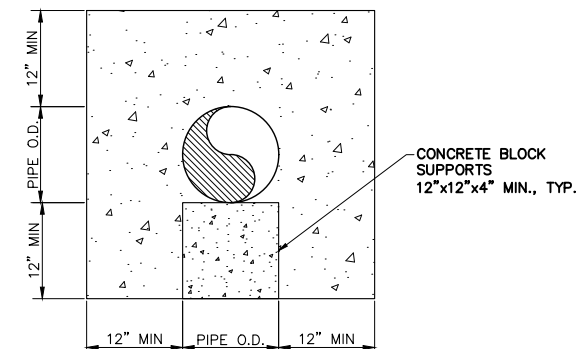
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3 SECTION '3' - INLET PIPING
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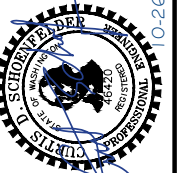
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5 CONCRETE PIPE ENCASEMENT
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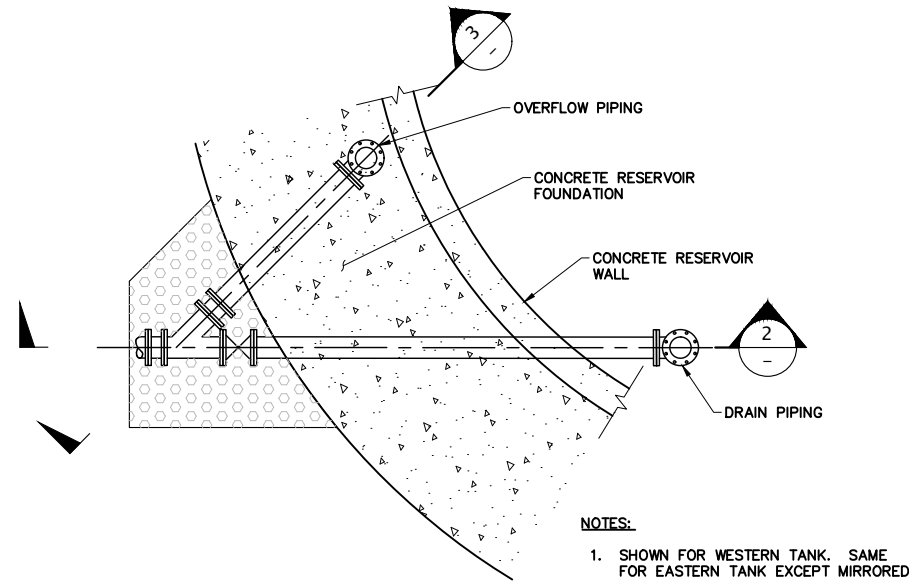
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LAKE WHATCOM WATER AND SEWER DISTRICT
WASHINGTON
DIVISION 7 RESERVOIR REPLACEMENT PROJECT
RESERVOIR INLET AND OUTLET PIPING

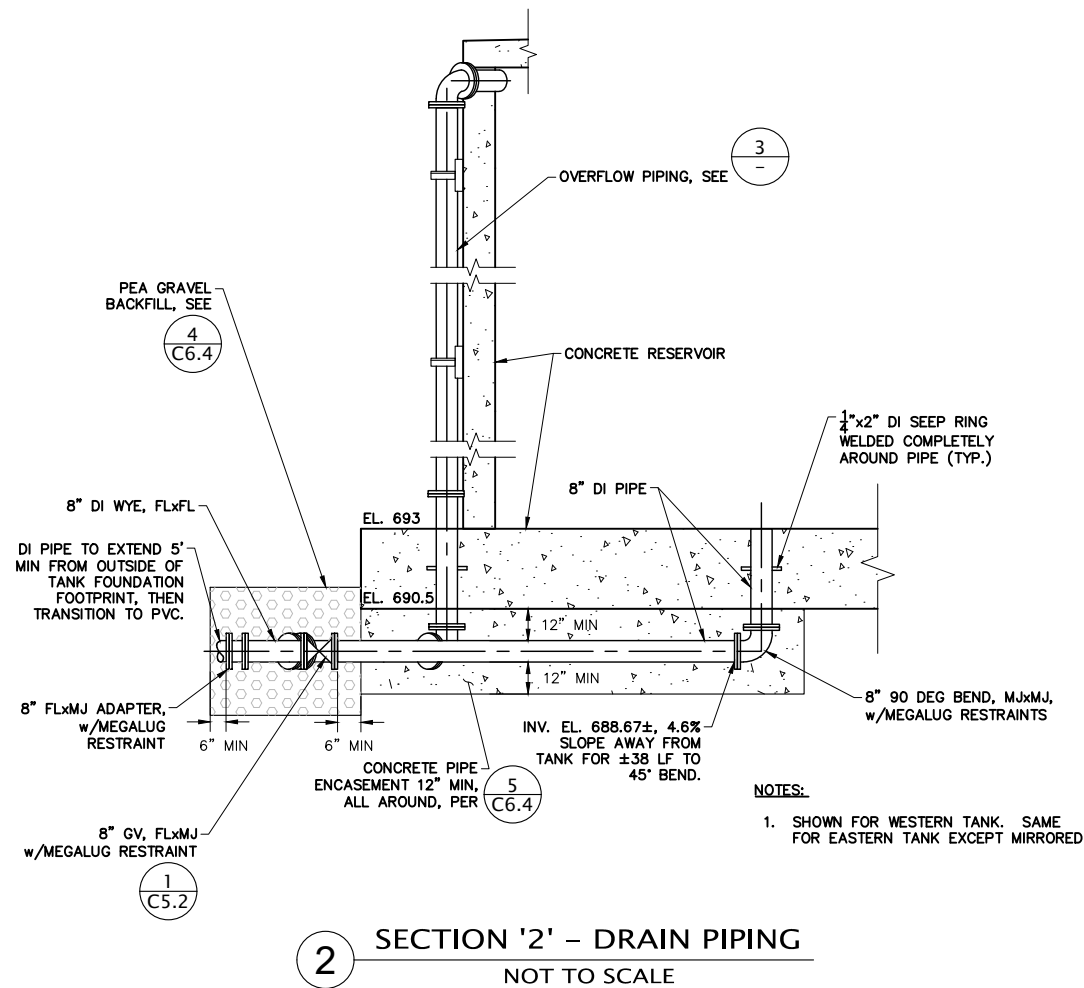
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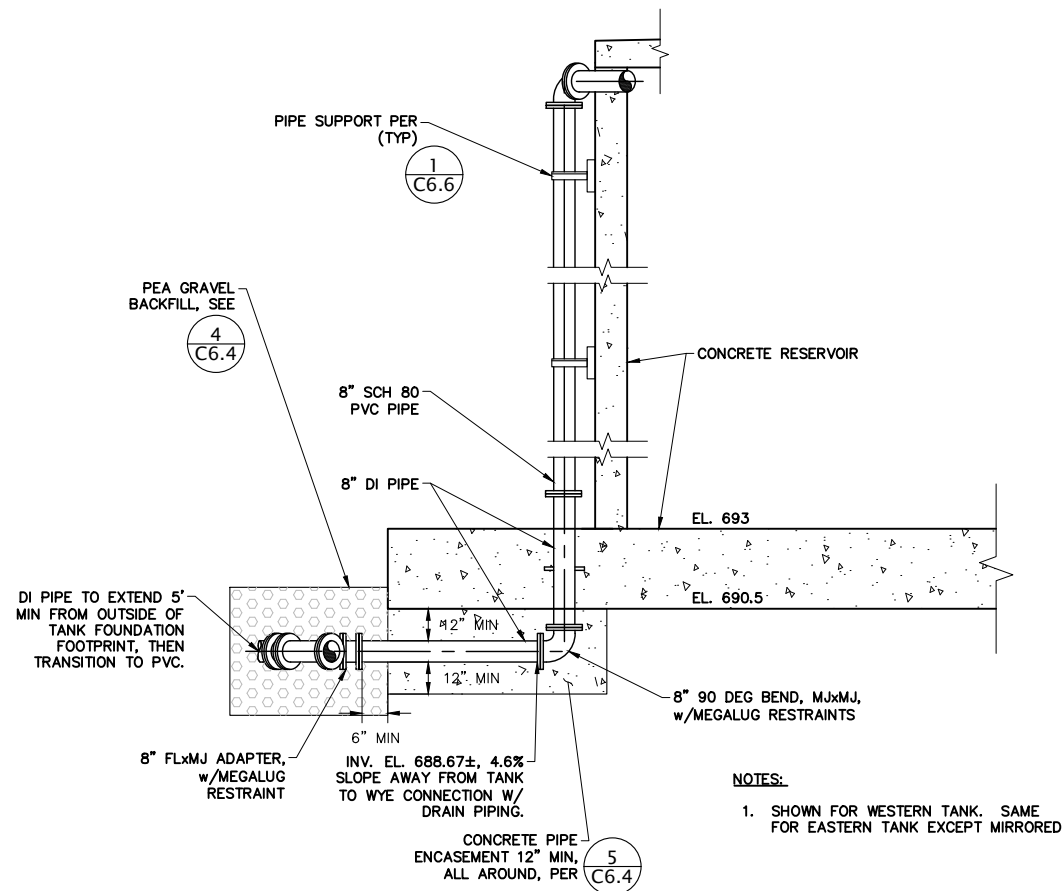
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1 OVERFLOW & DRAIN PIPING PLAN
NOT TO SCALE



2 SECTION '2' - DRAIN PIPING
NOT TO SCALE

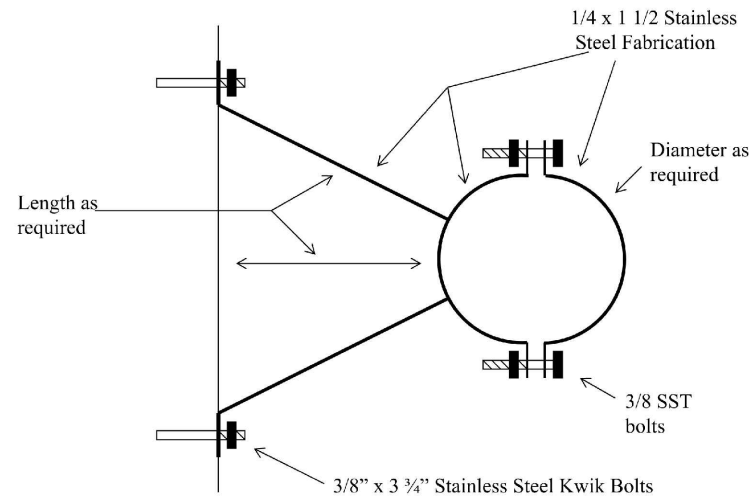


3 SECTION '3' - OVERFLOW PIPING
NOT TO SCALE



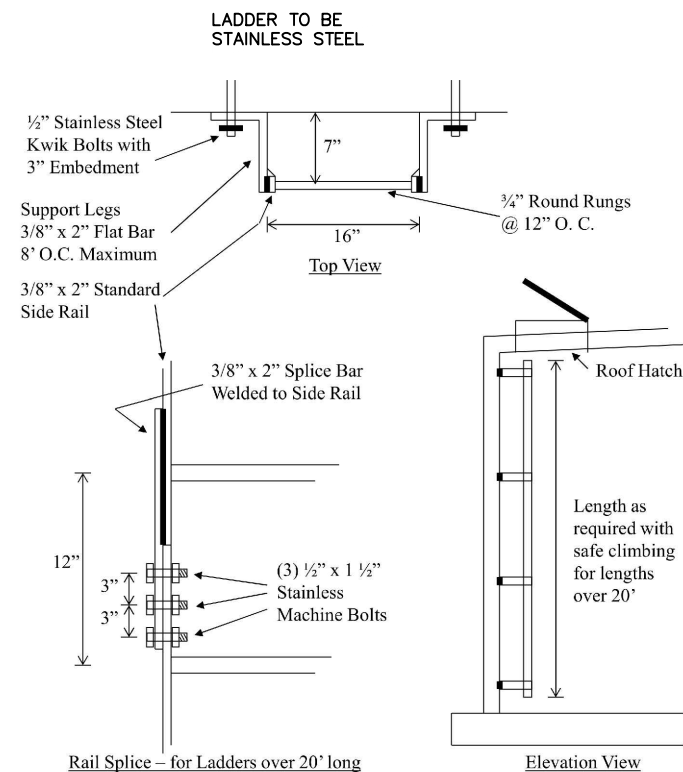
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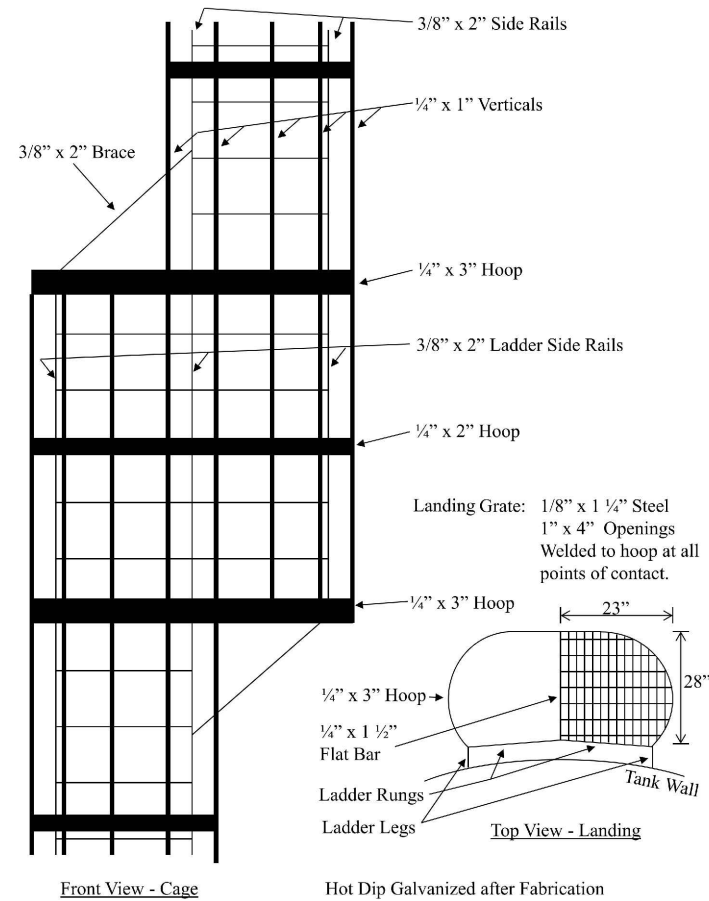
Brackets to be Stainless Steel fabrication
*BAKER SILO STANDARD DETAIL

1 INTERIOR PIPE SUPPORTS NOT TO SCALE

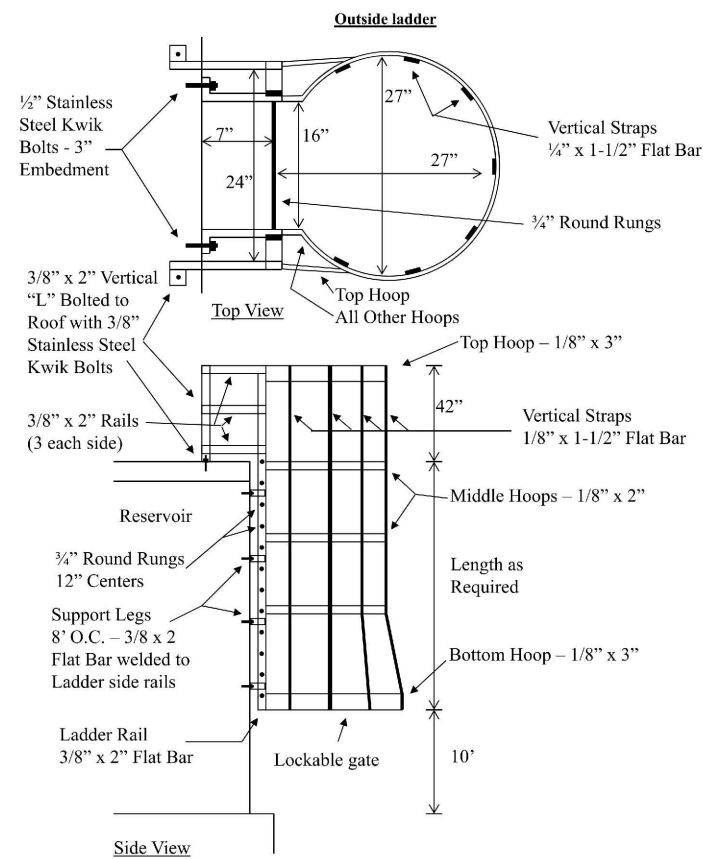


2 INTERIOR LADDER DETAIL NOT TO SCALE

*BAKER SILO STANDARD DETAIL, MODIFIED FOR MATERIAL



CAGE OFFSET



CAGE DETAIL

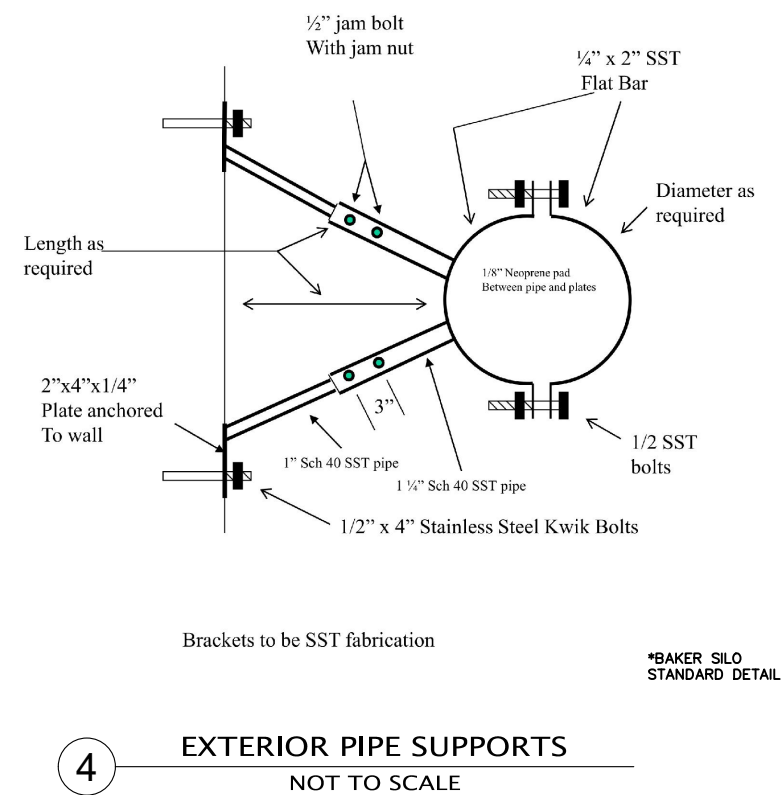
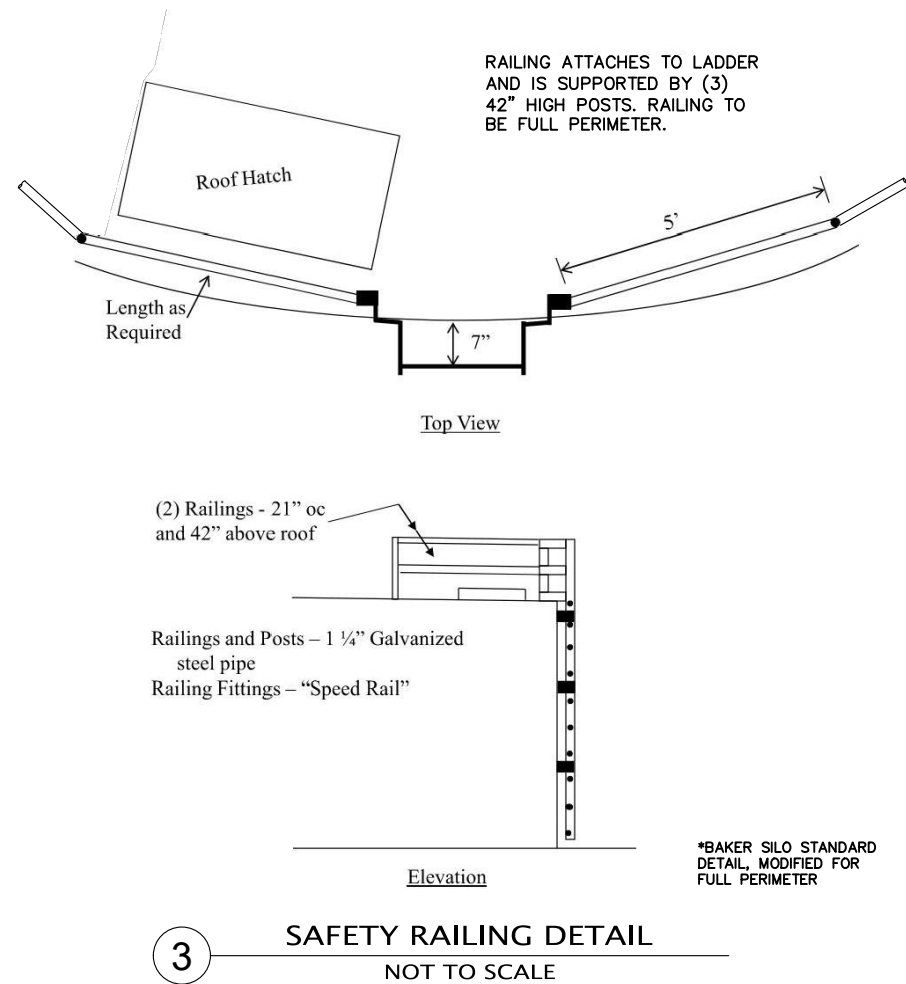
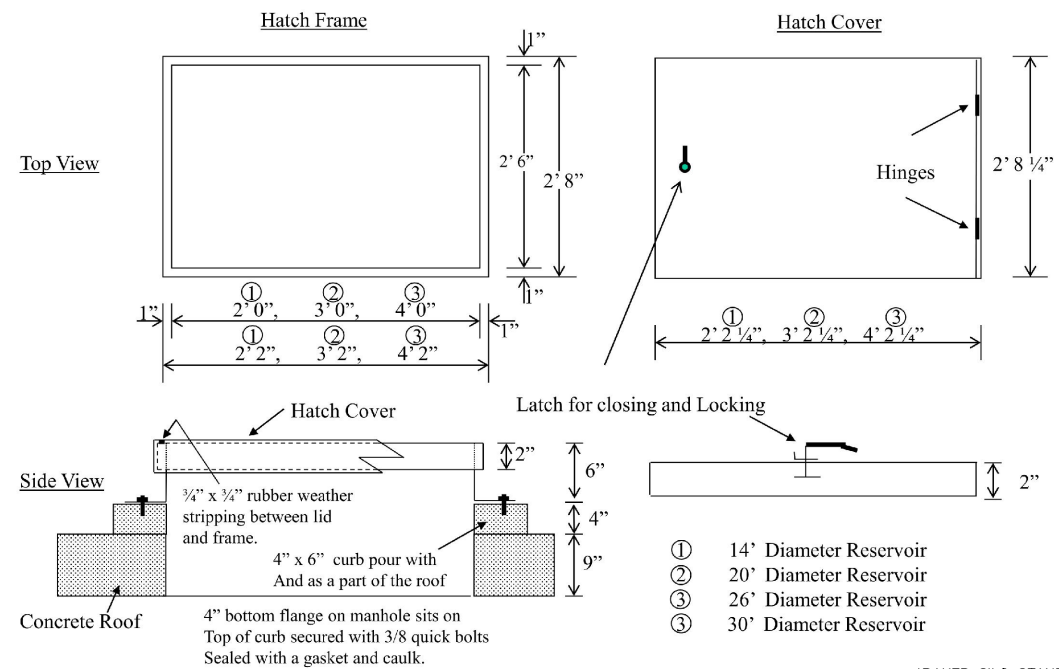
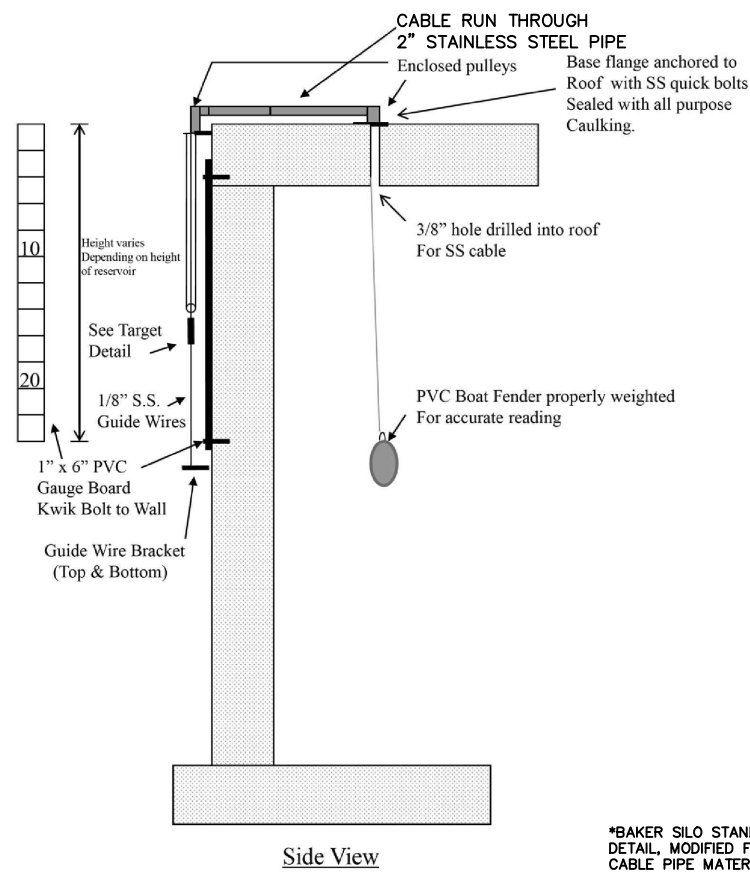
3 EXTERIOR LADDER DETAIL NOT TO SCALE

*BAKER SILO STANDARD DETAIL

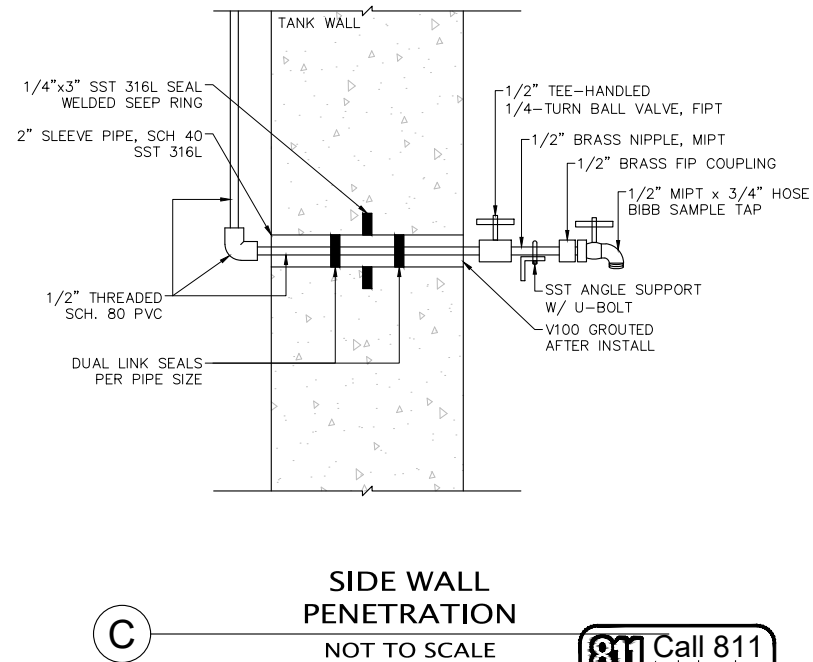
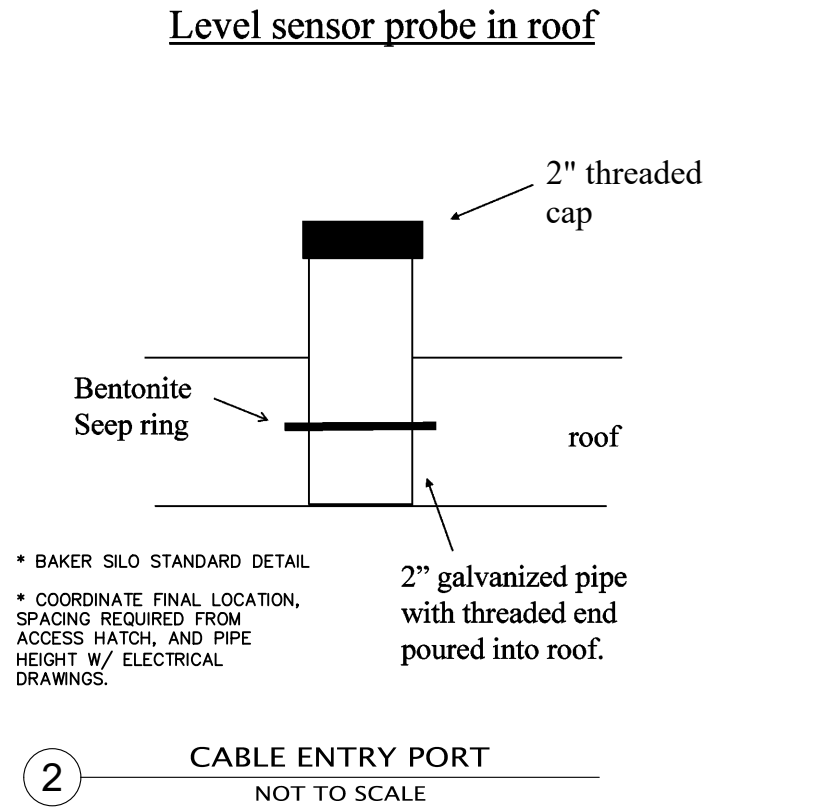
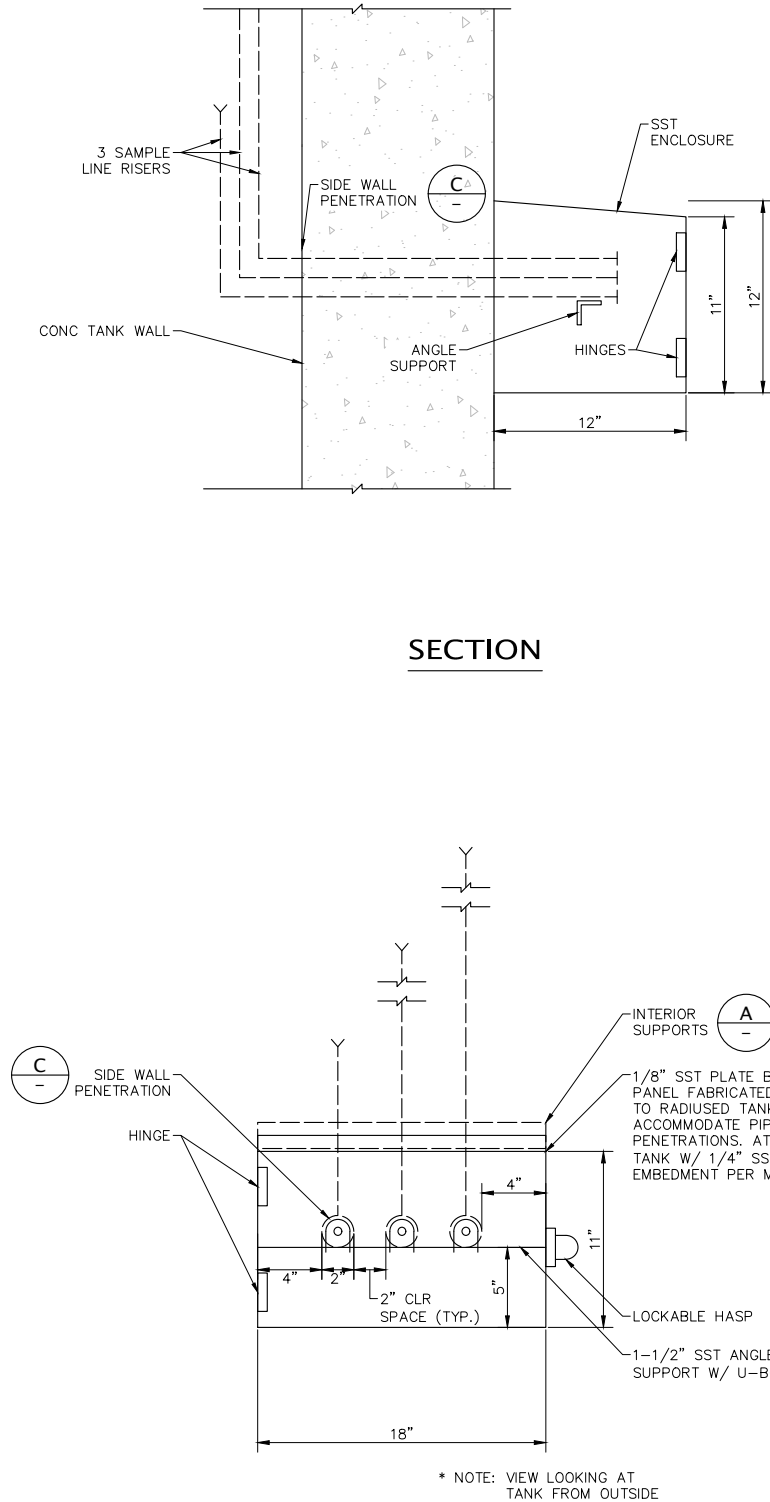
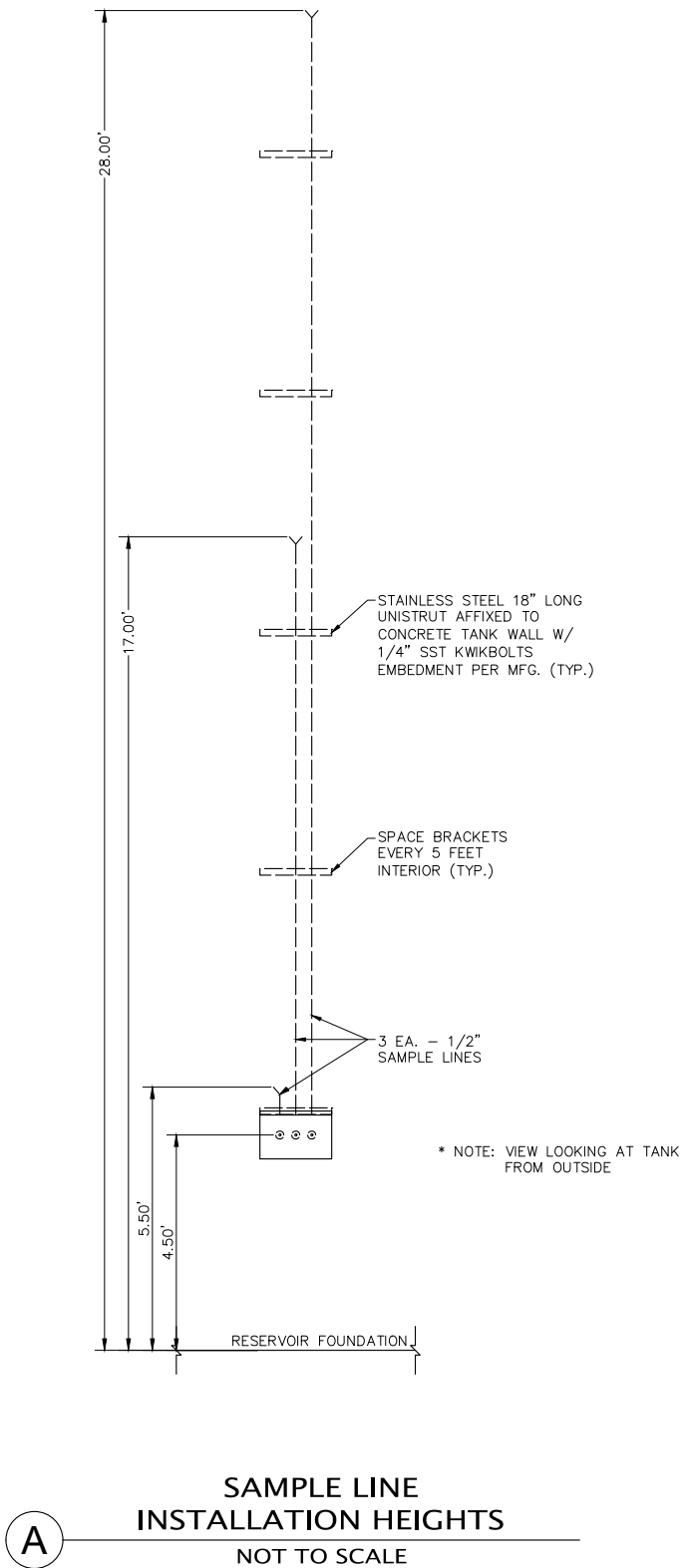
*INTRUSION SWITCHES & ALARMS SHALL BE COORDINATED W/ ELECTRICAL AND CONTROLS DRAWINGS.



BID DOCUMENTS



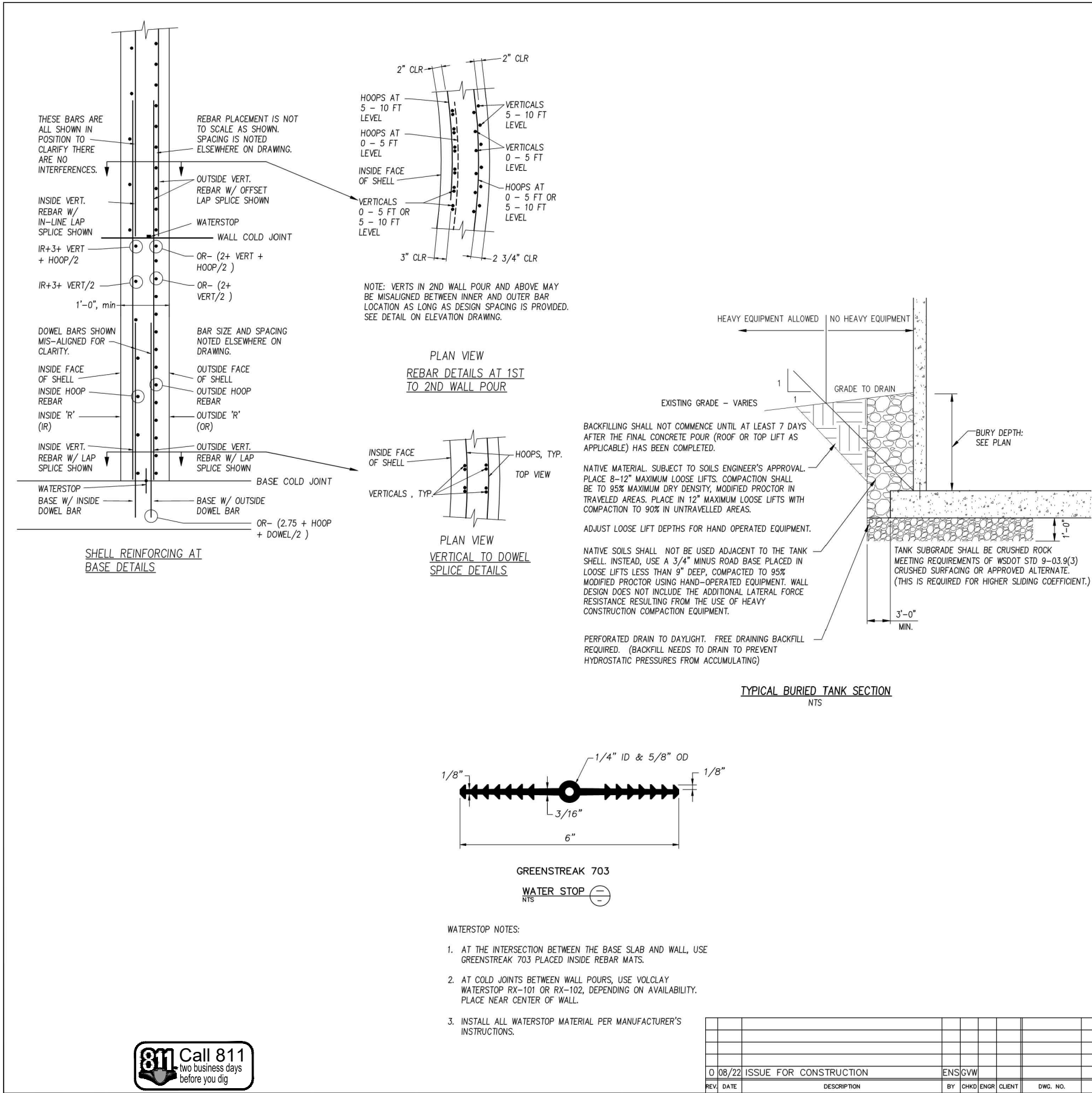
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BID DOCUMENTS

WILSON ENGINEERING		WILSONENGINEERING.COM	
		10-26-2023	
DESIGNED BY	CDS	DRAWN BY	EJH/LMH
CHECKED BY	MMM	CHECKED BY	MMM
LAKE WHATCOM WATER AND SEWER DISTRICT			
WASHINGTON			
DIVISION 7 RESERVOIR REPLACEMENT PROJECT			
RESERVOIR DETAILS			
DATE	10-11-2023	SCALE	AS SHOWN
SHEET	C6.8	PAGE	32 OF 50
JOB NUMBER 2021-130			

PLOT SETTINGS: WE AutoCAD PDF (General Documentation).pc3, WILSON 11X17, Portrait, 1:2, WE APWA_SCREENED.ctb
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REQUIRED VERIFICATIONS AND INSPECTIONS - CONCRETE CONSTRUCTION	CONTINUOUS	PERIODIC
INSPECT REINFORCING STEEL AND PLACEMENT		X
VERIFY USE OF REQUIRED DESIGN MIX		X
AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATION SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	
INSPECT FORMWORK FOR SHAPE, LOCATION, AND DIMENSION OF THE CONCRETE MEMBER BEING FORMED		X

PROVIDE A MINIMUM OF 6 CYLINDERS PER EACH 50 CY OR 6 CYLINDERS PER DAY AS APPLIES BASED ON STANDARD 4"Ø x 8" CYLINDERS TEST 6 CYLINDERS/50 CY AS FOLLOWS: 1 @ 7 DAYS, 3 @ 28 DAYS, 2 @ 56 DAYS. NOTIFY ENGINEER IF THIS IS NOT PROVIDED. VERIFY REBAR SIZE AND PLACEMENT PER APPROVED PLANS. INSPECTIONS SHALL BE PERFORMED BY QUALIFIED PERSONNEL FROM AN APPROVED AGENCY.

REQUIRED VERIFICATIONS AND INSPECTIONS - SOILS	CONTINUOUS	PERIODIC
VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY		X
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACH PROPER MATERIAL		X
PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		X
VERIFY USE OF PROPER MATERIALS, DENSITIES, AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	X	
PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X

BAKER SILO, LLC IS NOT RESPONSIBLE FOR THE SOILS AND SITE PREPARATION FOR THE PAD BENEATH THE RESERVOIR. THEY RELY ON THE OWNER/OWNER'S CONTRACTOR TO PROVIDE A SUITABLE BUILDING SURFACE THAT COMPLIES WITH THE REQUIREMENTS CONTAINED IN THE SOILS REPORT AND OTHER SUCH PROJECT DEFINING DOCUMENTS, INCLUDING VERIFICATION OF THESE CRITERIA BY INSPECTION REPORTS. WHEN BAKER SILO IS CALLED ON-SITE TO START WORK, THEY EXPECT THAT THE SOILS AND SUB-BASE HAS BEEN SATISFACTORILY PREPARED AND APPROVED FOR THEIR WORK TO COMMENCE.

REFER TO IBC 2018, CHAPTER 17 FOR SPECIAL INSPECTION EXPLANATIONS

WHEN SPECIAL INSPECTION IS REQUIRED, SPECIAL INSPECTORS SHALL BE PROVIDED BY WABO APPROVED SPECIAL INSPECTION AGENCY. IF DEFICIENCIES ARE FOUND DURING INSPECTION NOTIFY THE ENGINEER OF RECORD IMMEDIATELY.



08/17/2022

CONTRACTOR CONTACT INFORMATION:

BAKER SILO LLC
concrete water reservoirs & storage tanks

P.O. BOX 979
LYNDEN, WA. 98264
(360) 354-4940

ANVIL CORPORATION

1675 W. BAKERVIEW RD.
BELLINGHAM, WA. 98226
(360) 671-1450

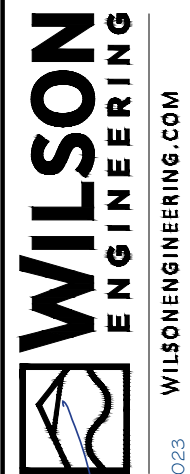
BAKER SILO, LLC
RESERVOIR
TYPICAL DETAILS

SCALE	JOB NO.	ACCT. CODE	AREA	DRAWING NO.	REV.
Noted	107749	547-22		DR-107749-SD-5001	0



BID DOCUMENTS

1 RESERVOIR TYPICAL DETAILS
NOT TO SCALE



DESIGNED BY CDS
DRAWN BY EJM/LMH
CHECKED BY MMM

LAKE WHATCOM WATER AND SEWER DISTRICT
WASHINGTON
DIVISION 7 RESERVOIR REPLACEMENT PROJECT
BAKER SILO STRUCTURAL PLANS - 2

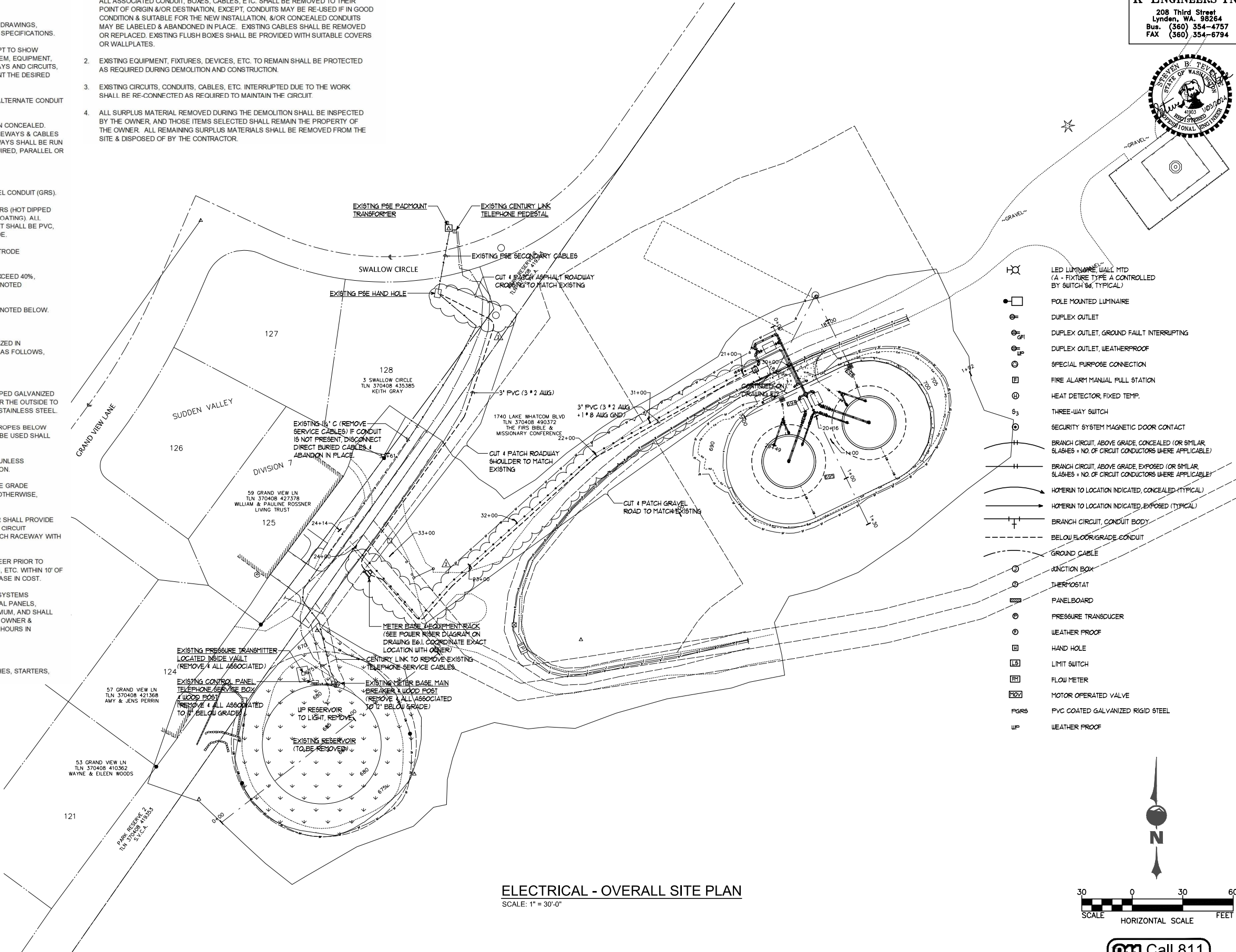
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DATE 10-11-2023
SCALE AS SHOWN
JOB NUMBER 2021-130
PAGE 34 OF 50

NOTES (APPLICABLE TO ALL ELECTRICAL DRAWINGS):

- ALL SYSTEMS, EQUIPMENT, DEVICES, RACEWAYS, CABLES, ETC. INDICATED ARE NEW UNLESS SPECIFICALLY NOTED AS EXISTING.
- ALL WIRING SHALL BE ENCLOSED WITHIN A RACEWAY SYSTEM.
- THE ELECTRICAL WORK SHALL INCLUDE ALL WORK SHOWN ON THE DRAWINGS, DETAILS, DIAGRAMS, SCHEDULES, ETC., AND AS DESCRIBED IN THE SPECIFICATIONS.
- PLAN DRAWINGS ARE DIAGRAMMATIC IN FORM AND DO NOT ATTEMPT TO SHOW COMPLETE DETAILS OR LIST EVERY ITEM OF THE ELECTRICAL SYSTEM, EQUIPMENT, OR BUILDING CONSTRUCTION; HOWEVER, THE ROUTING OF RACEWAYS AND CIRCUITS, THE LOCATIONS OF EQUIPMENT, DEVICES AND FIXTURES REPRESENT THE DESIRED FINISHED ARRANGEMENT.
- OBTAIN APPROVAL FROM ENGINEER PRIOR TO PROCEEDING WITH ALTERNATE CONDUIT ROUTES.
- RACEWAYS AND CABLES THROUGHOUT THE FACILITY SHALL BE RUN CONCEALED. WHERE DUE TO CONSTRUCTION, IT IS NOT POSSIBLE TO ROUTE RACEWAYS & CABLES CONCEALED, RACEWAYS MAY BE RUN EXPOSED. EXPOSED RACEWAYS SHALL BE RUN AS NEATLY & UNOBTRUSIVELY AS POSSIBLE, SUPPORTED AS REQUIRED, PARALLEL OR AT RIGHT ANGLES TO CEILINGS, WALLS & STRUCTURAL MEMBERS.
- RACEWAYS SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
 - INTERIOR & EXTERIOR ABOVE GRADE - GALVANIZED RIGID STEEL CONDUIT (GRS).
 - EXTERIOR BELOW GRADE CONDUITS SHALL BE PVC COATED GRS (HOT DIPPED GALVANIZED STEEL CONDUIT WITH THREADED ENDS AND PVC COATING). ALL OTHER CONDUITS SHALL BE GRS, EXCEPT TELEPHONE CONDUIT SHALL BE PVC, SCHEDULE 80. DIRECT BURIED A MINIMUM OF 24" BELOW GRADE.
 - ALL PORTIONS OF CONDUITS WITH CONTAIN GROUNDING ELECTRODE CONDUCTORS SHALL BE PVC SCHEDULE 80.
- RACEWAYS SHALL BE SIZED SO THAT THE CABLE FILL DOES NOT EXCEED 40%, EXCEPT, MINIMUM CONDUIT SIZES SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
 - 3/4" - BRANCH CIRCUITS AND SYSTEM RACEWAYS, EXCEPT AS NOTED BELOW.
 - 1" - UNDERGROUND CONDUITS.
- DEVICE BOXES SHALL BE STAINLESS STEEL AND SIZES SHALL BE SIZED IN ACCORDANCE WITH NEC FOR BOX FILL, EXCEPT MINIMUM SHALL BE AS FOLLOWS, UNLESS SPECIFICALLY NOTED OTHERWISE:
 - POWER & LIGHTING - 4" x 4" x 1 1/2"
- FLEXIBLE CONDUIT SHALL BE INTERLOCKING SINGLE STRIP, HOT DIPPED GALVANIZED AND SHALL HAVE A POLYVINYLE CHLORIDE JACKET EXTRUDED OVER THE OUTSIDE TO FORM A FLEXIBLE WATERTIGHT RACEWAY. ALL FITTINGS SHALL BE STAINLESS STEEL.
- TELECOMMUNICATIONS CONDUITS SHALL BE PROVIDED WITH PULL ROPES BELOW GRADE AND PULL STRINGS ABOVE GRADE. EXISTING CONDUITS TO BE USED SHALL BE FISHED AND CLEANED PRIOR TO INSTALLATION OF CABLES.
- BELOW GRADE SERVICE & FEEDER CABLE SHALL BE 1/C COPPER (UNLESS SPECIFICALLY NOTED OTHERWISE) WITH 600V TYPE XHHW INSULATION.
- BRANCH CIRCUIT CABLES, EQUIPMENT GROUND CABLES AND ABOVE GRADE FEEDER CABLES SHALL BE 1/C COPPER, #12 AWG UNLESS NOTED OTHERWISE, WITH 600V TYPE XHHW OR THHN/THWN INSULATION.
- IN ADDITION TO THE CIRCUIT CONDUCTORS INDICATED, CONTRACTOR SHALL PROVIDE AN EQUIPMENT GROUND CABLE (SIZED THE SAME AS THE LARGEST CIRCUIT CONDUCTOR UNLESS SPECIFICALLY NOTED OTHERWISE) WITHIN EACH RACEWAY WITH THE CIRCUIT CONDUCTORS.
- VERIFY ALL EQUIPMENT, DEVICE, ETC. LOCATIONS WITH THE ENGINEER PRIOR TO ROUGH-IN. THE OWNER RESERVES THE RIGHT TO RELOCATE ITEMS, ETC. WITHIN 10' OF THE LOCATION INDICATED, PRIOR TO INSTALLATION. WITHOUT INCREASE IN COST.
- POWER, FIRE ALARM, SECURITY, TELECOMMUNICATIONS & UTILITY SYSTEMS INTERRUPTIONS (WHETHER TO THE ENTIRE SYSTEM OR TO INDIVIDUAL PANELS, EQUIPMENT, DEVICES, ETC.) SHALL BE KEPT TO AN ABSOLUTE MINIMUM, AND SHALL NOT BE DONE WITHOUT PRIOR APPROVAL & SCHEDULING WITH THE OWNER & ENGINEER A MINIMUM OF 14 DAYS IN ADVANCE AND CONFIRMED 48 HOURS IN ADVANCE.
- LABELING & NAMEPLATES:
 - REFER TO SPECIFICATIONS FOR PANELS, DISCONNECT SWITCHES, STARTERS, ETC. NAMEPLATES AND LABELING.

DEMOLITION NOTES (APPLICABLE TO ALL ELECTRICAL DRAWINGS):

- CONTRACTOR SHALL REMOVE ALL EXISTING EQUIPMENT, DEVICES, ETC. WHERE INDICATED. EXISTING DEVICES NOT SHOWN ON THE DRAWINGS SHALL REMAIN. ALL ASSOCIATED CONDUIT, BOXES, CABLES, ETC. SHALL BE REMOVED TO THEIR POINT OF ORIGIN &/OR DESTINATION, EXCEPT, CONDUITS MAY BE RE-USED IF IN GOOD CONDITION & SUITABLE FOR THE NEW INSTALLATION, &/OR CONCEALED CONDUITS MAY BE LABELED & ABANDONED IN PLACE. EXISTING CABLES SHALL BE REMOVED OR REPLACED. EXISTING FLUSH BOXES SHALL BE PROVIDED WITH SUITABLE COVERS OR WALLPLATES.
- EXISTING EQUIPMENT, FIXTURES, DEVICES, ETC. TO REMAIN SHALL BE PROTECTED AS REQUIRED DURING DEMOLITION AND CONSTRUCTION.
- EXISTING CIRCUITS, CONDUITS, CABLES, ETC. INTERRUPTED DUE TO THE WORK SHALL BE RE-CONNECTED AS REQUIRED TO MAINTAIN THE CIRCUIT.
- ALL SURPLUS MATERIAL REMOVED DURING THE DEMOLITION SHALL BE INSPECTED BY THE OWNER, AND THOSE ITEMS SELECTED SHALL REMAIN THE PROPERTY OF THE OWNER. ALL REMAINING SURPLUS MATERIALS SHALL BE REMOVED FROM THE SITE & DISPOSED OF BY THE CONTRACTOR.



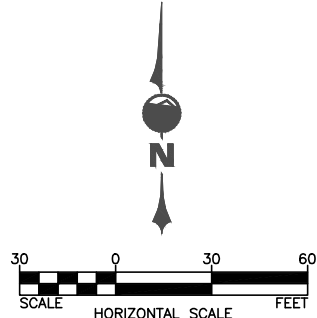
ELECTRICAL - OVERALL SITE PLAN
SCALE: 1" = 30'-0"

NO.	REVISIONS	BY	DATE
1	RELOCATE POWER METER	STV	12/20/2023
2	RELOCATE METER & ROUTING.	STV	1/03/2024

K ENGINEERS INC.
208 Third Street
Lynden, WA, 98264
Bus: (360) 354-4757
Fax: (360) 354-6794



- LED LUMINAIRE, WALL MTD (A - FIXTURE TYPE A CONTROLLED BY SWITCH, TYPICAL)
- POLE MOUNTED LUMINAIRE
- DUPLEX OUTLET
- DUPLEX OUTLET, GROUND FAULT INTERRUPTING
- DUPLEX OUTLET, WEATHERPROOF
- SPECIAL PURPOSE CONNECTION
- FIRE ALARM MANUAL PULL STATION
- HEAT DETECTOR, FIXED TEMP.
- THREE-WAY SWITCH
- SECURITY SYSTEM MAGNETIC DOOR CONTACT
- BRANCH CIRCUIT, ABOVE GRADE, CONCEALED (OR SIMILAR, SLASHES = NO. OF CIRCUIT CONDUCTORS WHERE APPLICABLE)
- BRANCH CIRCUIT, ABOVE GRADE, EXPOSED (OR SIMILAR, SLASHES = NO. OF CIRCUIT CONDUCTORS WHERE APPLICABLE)
- HOMERUN TO LOCATION INDICATED, CONCEALED (TYPICAL)
- HOMERUN TO LOCATION INDICATED, EXPOSED (TYPICAL)
- BRANCH CIRCUIT, CONDUIT BODY
- BELOW FLOOR/GRADE CONDUIT
- GROUND CABLE
- JUNCTION BOX
- THERMOSTAT
- PANELBOARD
- PRESSURE TRANSDUCER
- WEATHER PROOF
- HAND HOLE
- LIMIT SWITCH
- FLOW METER
- MOTOR OPERATED VALVE
- PVC COATED GALVANIZED RIGID STEEL
- WEATHER PROOF



811 Call 811
two business days
before you dig

DESIGNED BY

STV

DRAWN BY

KL

CHECKED BY

STV

DATE

10-20-2023

SCALE

1" = 30'-0"

JOB NUMBER

2184

LAKE WHATCOM WATER AND SEWER DISTRICT

BELLINGHAM

DIVISION 7 RESERVOIR REPLACEMENT PROJECT

WASHINGTON

E1.1

PAGE

35

OF

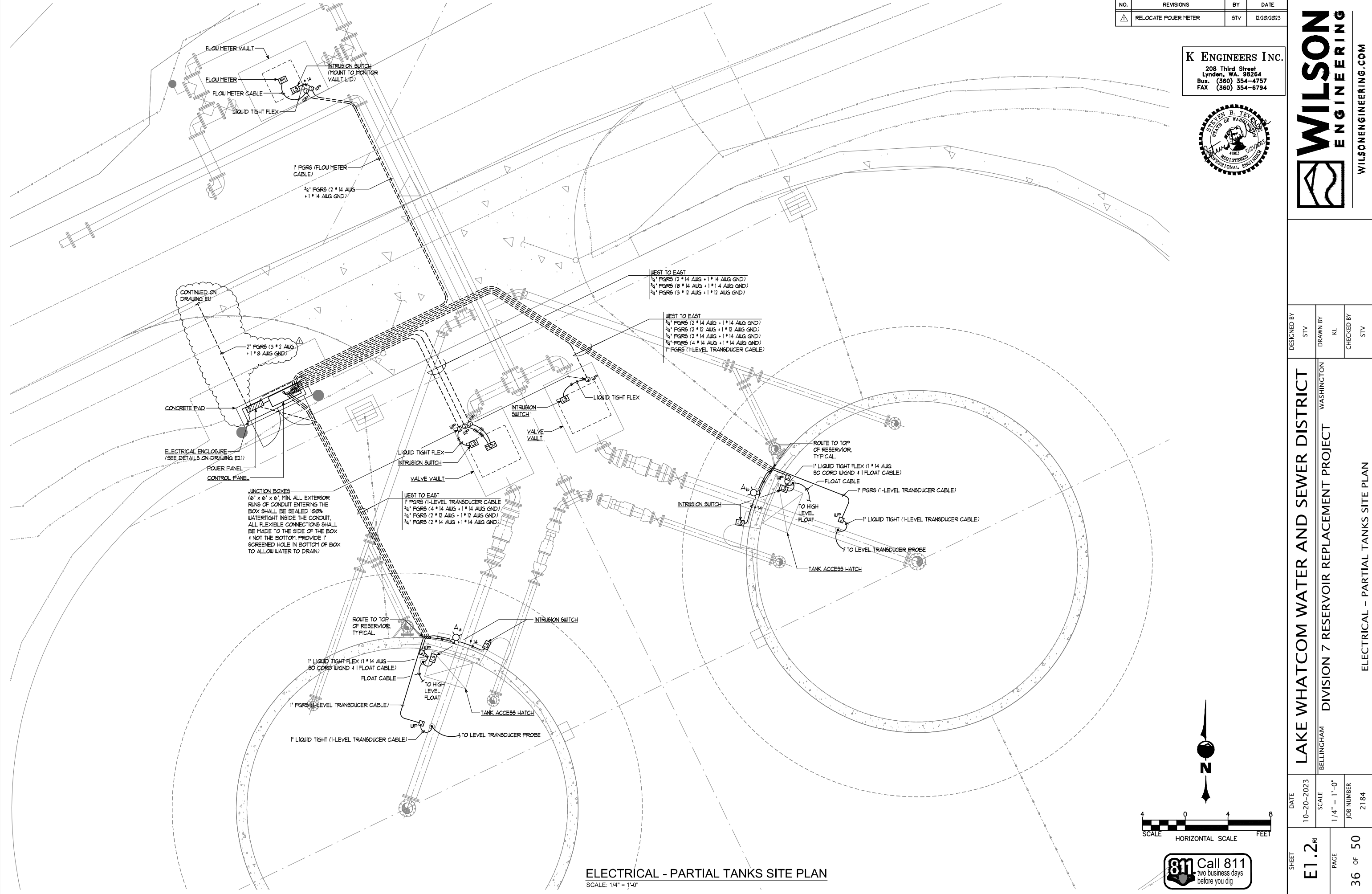
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WILSON

ENGINEERING

WILSONENGINEERING.COM

ELECTRICAL - OVERALL SITE PLAN, LEGEND & NOTES



NO.	REVISIONS	BY	DATE
△	RELOCATE POWER METER	STV	12/20/2023

K ENGINEERS INC.
208 Third Street
Lynden, WA, 98264
Bus: (360) 354-4757
FAX (360) 354-6794



ELECTRICAL - DETAILS

LAKE WHATCOM WATER AND SEWER DISTRICT

BELLINGHAM DIVISION 7 RESERVOIR REPLACEMENT PROJECT WASHINGTON

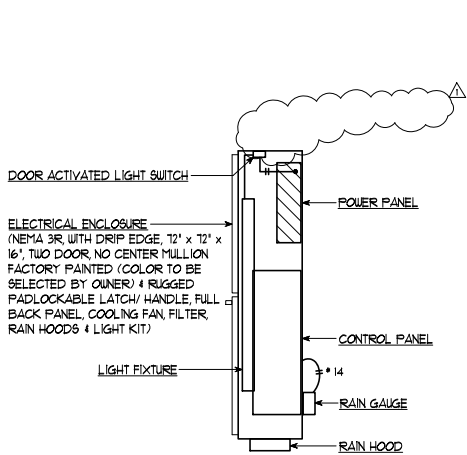
DATE
10-20-2023

SCALE
AS NOTED

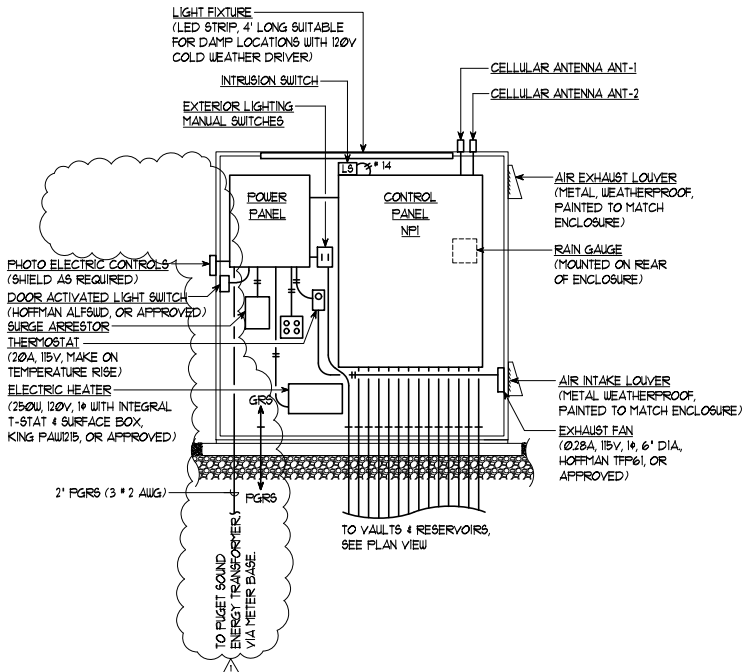
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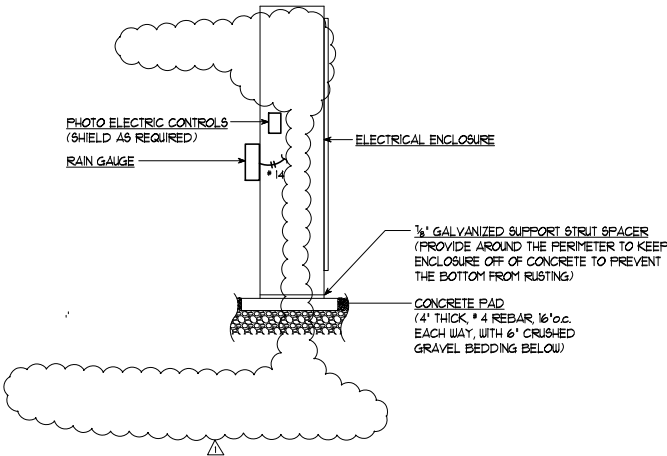
PAGE
37 OF 50



TOP VIEW



SECTION



ELEVATION

ELECTRICAL ENCLOSURE

SCALE: 1/2" = 1'-0"

NO.	REVISIONS	BY	DATE
△	RELOCATE POWER METER	STV	12/20/2023

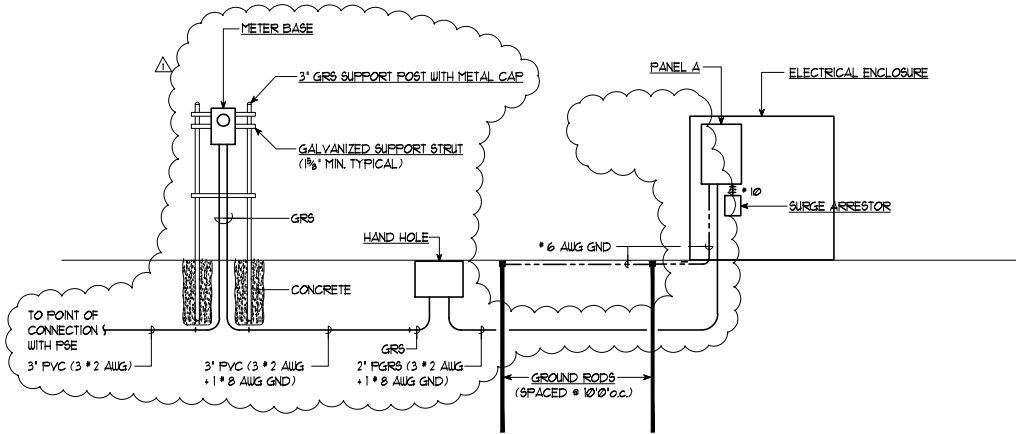
K ENGINEERS INC.
208 Third Street
Lynden, WA, 98264
Bus: (360) 354-4757
FAX (360) 354-6794



LIGHTING FIXTURE SCHEDULE						
TYPE	DESCRIPTION	VOLTS	MANUFACTURER & CAT. NO. (OR APPROVED EQUAL)	LAMP(S)	LOADS	
					WATTS	VA
A	EXTERIOR TRAPEZOIDAL SCONCE, LED, 18W MAX, 1200 LUMENS MIN, TYPE 3 DISTRIBUTION, 12" x 6" x 7"D, SUITABLE FOR WET LOCATIONS, INTEGRAL ALUMINUM HEAT SINK, DIECAST ALUMINUM HOUSING (BRONZE), INTEGRAL PHOTOELECTRIC CONTROL, SPECULAR ALUMINUM REFLECTOR AND CUTOFF OPTICS.	120	GARDCO 111L-16L-350-NW-G3-3-PCB-BZ	LED 4000K (INTEGRAL)	18	18
B						
C						

NOTES:

1. CONTRACTOR & LIGHTING FIXTURE SUPPLIER SHALL VERIFY DESCRIPTION, MOUNTING REQUIREMENTS, CATALOG NUMBERS, ETC. MATCH, ADVISE ENGINEER OF ANY CONFLICTS OR DISCREPANCIES.



ELECTRICAL - POWER SYSTEM RISER DIAGRAM

SCALE: NONE

METER BASE		ELECTRICAL ENCLOSURE					
VOLTAGE: 120/240V, 1 PH, 3 W		ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA)		DEMAND	DEMAND	
ENCLOSURE: NEMA 3R			EXIST.	NEW	TOTAL	FACTOR	LOAD (VA)
MOUNTING: SURFACE		Lighting	0.0	66.0	66.0	1.25	82.5
CONTINUOUS RATING: 100 A		Gen. Purpose Outlets (First 10 KVA)	0.0	360.0	360.0	1.00	360.0
PER PUGET SOUND ENERGY REQUIREMENTS		Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT		Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
		Mechanical Equipment	0.0	1332.2	1332.2	1.00	1332.2
		Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
		Miscellaneous	0.0	0.0	0.0	1.00	0.0
		25% Largest Motor					125.0
		TOTAL LOAD	0.0	1758.2	1758.2		1899.7
		TOTAL AMPS	0.0	7.3	7.3		7.9

PANEL A										INSIDE ELECTRICAL ENCLOSURE									
VOLTAGE: 120/240V, 1 PH, 3 W TYPE: PANELBOARD ENCLOSURE: NEMA 1 MOUNTING: SURFACE				FEEDER/BRANCH CIRCUIT DEVICES: BOLT-ON CIRCUIT BREAKERS FULL AIC RATING: 10,000 A SERIES AIC RATING: NONE				ELECTRICAL LOAD CALCULATION Lighting Gen. Purpose Outlets (First 10 KVA) Gen. Purpose Outlets (Remainder) Special Purpose Outlets Mechanical Equipment Kitchen Equipment & Appliances Miscellaneous 25% Largest Motor				CONN. LOAD (VA)			DEMAND		DEMAND		
												EXIST.	NEW	TOTAL	FACTOR	LOAD (VA)			
BUSSING: MANUFACTURERS STANDARD CONTINUOUS RATING: 100 A FULL AIC RATING: 10,000 A SERIES AIC RATING: NONE				SPECIAL PROVISIONS: MASTER NAMEPLATE GROUND BAR SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT				TOTAL LOAD TOTAL AMPS				0.0	66.0	66.0	1.25	82.5			
												0.0	360.0	360.0	1.00	360.0			
												0.0	0.0	0.0	0.50	0.0			
												0.0	0.0	0.0	1.00	0.0			
MAIN: CIRCUIT BREAKER CONTINUOUS RATING: 70 A FULL AIC RATING: 10,000 A SERIES AIC RATING: NONE LOCATION: BOTTOM												0.0	1332.2	1332.2	1.00	1332.2			
												0.0	0.0	0.0	1.00	0.0			
												0.0	0.0	0.0	1.00	0.0			
												0.0	0.0	0.0	1.00	0.0			
												0.0	1758.2	1758.2			1899.7		
												0.0	7.3	7.3			7.9		
CONN. LOAD (VA)		FEEDER/BRANCH CIRCUIT DESCRIPTION			NOTE	BKR AMP/P	CKT NO	BUS (PHASE)	CKT NO	BKR AMP/P	FEEDER/BRANCH CIRCUIT DESCRIPTION			NOTE	CONN. LOAD (VA)				
36.0		LTG - TANKS					20/1	1	A	2	20/1	CONTROL PANEL				600.0			
0.0		SPARE					20/1	3	A	B	4	20/1	SPARE				0.0		
390.0		LTG & OUTLETS - ELECTRICAL ENCLOSURE					20/1	5	A	A	6	20/1	SPARE				0.0		
32.2		EXHAUST FAN - ELECTRICAL ENCLOSURE					20/1	7	A	B	8	20/1	SPARE				0.0		
500.0		HEATER - ELECTRICAL ENCLOSURE					20/1	9	A	A	10	20/1	SPARE				0.0		
0.0		SPARE					20/1	11	B	B	12	20/1	SPARE				0.0		
0.0							SPACE	13	A	A	14	SPACE					0.0		
0.0							SPACE	15	A	B	16	SPACE					0.0		
0.0							SPACE	17	A	A	18	SPACE					0.0		
0.0							SPACE	19	B	B	20	SPACE					0.0		
0.0							SPACE	21	A	A	22	SPACE					0.0		
0.0							SPACE	23	B	B	24	SPACE					0.0		
0.0							SPACE	25	A	A	26	SPACE					0.0		
0.0							SPACE	27	B	B	28	SPACE					0.0		
0.0		SURGE ARRESTOR					30/2	27	A	B	28	SPACE					0.0		
0.0								29	A	A	30	SPACE					0.0		
MAIN CIRCUIT BREAKER																			

PLOT SETTINGS: RICOH 8X11-- B&W,ps3, Letter, Portrait, 1:1.05, WE APWA_UNSCREENED.ctb
W:\2021\2021-130 LWSD DIV 7 TANK DWG\REF\ADDL SHEETS.DWG - 10/17/2023 2:41 PM - Benton Seay

DRAWING NAME				DESCRIPTION				DRAWING TYPE			
D-01				BILL OF MATERIALS							
D-02				BILL OF MATERIALS							
D-03				BILL OF MATERIALS							
D-04				BILL OF MATERIALS							
P-00				TELEMETRY PANEL				PANEL LAYOUT DIAGRAM			
N-00				NETWORK DIAGRAM				COMMUNICATIONS LAYOUT			
C-00				TELEMETRY PANEL, POWER DISTRIBUTION				CONTROL WIRING DIAGRAM			
C-01				TELEMETRY PANEL, PLC DIGITAL INPUTS				CONTROL WIRING DIAGRAM			
C-02				TELEMETRY PANEL, PLC DIGITAL OUTPUTS				CONTROL WIRING DIAGRAM			
C-03				TELEMETRY PANEL, PLC ANALOG INPUTS				CONTROL WIRING DIAGRAM			
C-04				TELEMETRY PANEL, PLC ANALOG OUTPUTS				CONTROL WIRING DIAGRAM			

WIRING SPECIFICATIONS

(MAIN SUPPLY SOURCE)

VAC POWERSTRANDED COPPER, MTW, BLACK W/ PHASES COLORED

VAC CONTROLSTRANDED COPPER, MTW, RED

VAC NEUTRALSTRANDED COPPER, MTW, WHITE

GROUNDSTRANDED COPPER, MTW, GREEN

VDC CONTROLSTRANDED COPPER, MTW, BLUE

VDC COMMONSTRANDED COPPER, MTW, WHITE W/ BLUE STRIPE

VDC ANALOGTWISTED SHIELDED PAIR, BLACK AND CLEAR

(EXTERNAL SUPPLY SOURCE, ENERGIZED WITH MAIN DISCONNECT OFF)

FOREIGN CONTROLSTRANDED COPPER, MTW, YELLOW

FOREIGN GROUNDED NEG.STRANDED COPPER, MTW, WHITE W/ YELLOW STRIPE

WIRE SIZED AT MINIMUM PER UL508A, TABLES 28.1 AND 38.1

FIELD WIRING SHALL BE COPPER WIRE WITH MINIMUM 60 DEG. C INSULATION RATING UNDER 100 AMPS, 75 DEG. C INSULATION RATING 100 AMPS OR MORE

TORQUE SCREWS AT FIELD WIRING AND FUSED TERMINAL BLOCKS TO 7 LB. IN., TORQUE SCREWS AT CIRCUIT BREAKERS TO 21 LB. IN., OR TORQUE AS INDICATED ON LABEL NEAR TERMINALS.

CONTROL PANEL LABELS

THE FOLLOWING LABELS WILL BE PLACED WITHIN THE CONTROL PANEL IF LISTED IN THE CONTROL PANEL LAYOUT (P) DRAWING

1QCC NAMEPLATE (FRONT DOOR)

2MAIN POWER NAMEPLATE (INTERIOR)

3FIELD WIRING SPECIFICATION (INTERIOR)

4NON-UL COMPONENT (NEAR NON-UL ITEM)

5MULTIPLE POWER SOURCES (FRONT DOOR)

6INSTANTANEOUS TRIP CIRCUIT BREAKER (2 LABELS NEAR DEVICE)

7HIGH FAULT SCCR BRANCH CIRCUIT TRIP (NEAR CB)

8INTRINSICALLY SAFE FIELD WIRING (NEAR I.S. FIELD TERMINALS)

9INTERFACE TO HAZARDOUS LOCATIONS (2 LABELS ON FRONT DOOR)

10208, 240, OR 480 VAC LABEL (FRONT DOOR)

11UPS POWER (FRONT DOOR)

12NON-UL LOW VOLTAGE COMPONENT, EXTERNALLY POWERED (NEAR FUSE)

13SUITABLE FOR USE AS SERVICE EQUIPMENT (NEAR MAIN POWER NAMEPLATE)

LEGEND

60

BILL OF MATERIALS ITEM NO.

---WIRING BY OTHERS

▲EQUIPMENT BY OTHERS

1

MAIN DISCONNECT AND BRANCH CIRCUIT PROTECTION PROVIDED IN THE FIELD BY OTHERS

2

INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE N.E.C. CABLE LENGTH SHALL NOT EXCEED 1,000 FT.

REV.

DESCRIPTION

BY

DATE

C90% REVIEW

J. YAO

7/21/23

BDISTRICT REVIEW

N. DEBOLDT

6/8/23

AVALVE & INTRUSION I/O

N. DEBOLDT

5/17/23

QCC

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Lynnwood, WA 98036

(425) 778-8280

www.Quality-Controls.com

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N. DEBOLDT

END USER:

LAKE WHATCOM W&S DISTRICT

APPD. BY:

J. YAO

CUSTOMER:

WILSON ENGINEERING

DATE:

2/1/23

CONSULTANT:

QCC

Division 7 Reservoir Replacement Project

Instrumentation & Controls

Drawing List

QCC PROJECT NO.


P2125

DWG. NO.

D-00

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DRAWN BY

CHECKED BY

LAKE WHATCOM WATER AND SEWER DISTRICT

WASHINGTON

DIVISION 7 RESERVOIR REPLACEMENT PROJECT

INSTRUMENTATION & CONTROLS - DRAWING LIST

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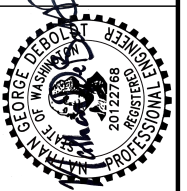
Item No	Name / Tag No.	Qty.	Description	Manufacturer	Man. Part No.	Vendor
FIELD INSTRUMENTATION						
1.0	Flow Meter	1	Magnetic Inductive Flowmeter, DN300 12" PROMAG W 400 CSA Cl. 1 Div 2 Approval Cl. 150, Stainless steel fixed flange ASME B16.5 Liner: Hard Rubber St. Steel 1.4571 316 Ti Electrodes IP 68 (NEMA 4X/6P) Remote Transmitter, 75 ft cable NSF 61 drinking water approval	Endress+Hauser	5W4C80- C6CLHP5DHA1S GA+AACQI7L4	Field Instruments & Controls
2.0	Radar Level Transmitter - West Tank	1	Radar Level Transmitter CA: Approval: CSA C/US General Purpose P: PS/Output: 2-wire HART, HART/Bluetooth config BN: Antenna: 80mm/3.0", 20m liquid, -40 - 176 degF VCE: Rear Process Connection: 1" mNPT PVDF, 1/2" fNPT conduit connection XR0: Front Process Connection: None A: Cable Length: 150ft	Endress + Hauser	FMR20- CAPBNVCEXR0A	Field Instruments & Controls
2.1	Radar Level Transmitter - East Tank	1	Radar Level Transmitter CA: Approval: CSA C/US General Purpose P: PS/Output: 2-wire HART, HART/Bluetooth config BN: Antenna: 80mm/3.0", 20m liquid, -40 - 176 degF VCE: Rear Process Connection: 1" mNPT PVDF, 1/2" fNPT conduit connection XR0: Front Process Connection: None A: Cable Length: 115ft	Endress + Hauser	FMR20- CAPBNVCEXR0A	Field Instruments & Controls
3.0	Tipping Bucket Rain Gauge	1	Tipping Bucket Rain Gauge, 0.01" Accuracy, 24VDC Reed Switch Output	HyQuest Solutions	TB3	Kisters
4.0	Float Switch - Water	2	Float Switch: Non-Mercury, Polypropylene casing, Internal Weight, NO & NC Contact, 60 Ft. Cable	Anchor Scientific	GS160NONC	H.D. Fowler

F				 <div>Quality Controls Corporation 5015 208th St. SW, Suite 1-B Lynnwood, WA 98036 (425) 778-8280 www.Quality-Controls.com</div>	DRAWN BY: N. DEBOLDT	END USER: LAKE WHATCOM W&S DISTRICT	Division 7 Reservoir Replacement Project Bill of Materials	QCC PROJECT NO. P2125	
	C	90% REVIEW	J. YAO	7/21/23	APPD. BY: J. YAO	CUSTOMER: WILSON ENGINEERING		DWG. NO.	
	B	DISTRICT REVIEW	N. DEBOLDT	6/8/23	DATE: 2/1/23	CONSULTANT: QCC		D-01	
	A	VALVE & INTRUSION I/O	N. DEBOLDT	5/17/23					
	REV.	DESCRIPTION	BY	DATE					

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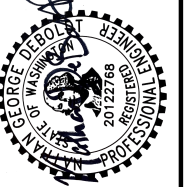
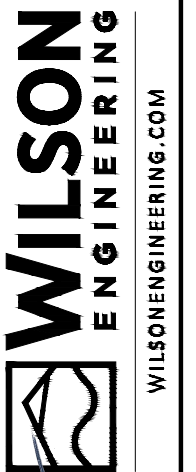
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Item No	Name / Tag No.	Qty.	Description	Manufacturer	Man. Part No.	Vendor
5.0	Limit Switch	6	Limit Switch: NEMA 4, Spring Return, 1 N.O. - 1 N.C.	Eaton	E50AR1	Platt Electric
5.1	Limit Switch	6	Limit Switch Lever Arm: 2", Metal Roller	Eaton	E50KL549	Platt Electric
6.0	Limit Switch - Ladder	2	Door Switch: Surface Mount, SPDT	Sentrol	2707A-L	JMAC
CONTROL PANEL INSTRUMENTATION						
21.0	Enclosure - Wall Mount Type 4X SS	1	Enclosure: NEMA 4, 304SS, 48"H x 36"W x 12"D	Saginaw	SCE-48EL3612LPPL	Saginaw Controls
21.1	Enclosure - Wall Mount Type 4X SS	1	Backpanel: 45.0"H x 33.0"W, Steel, White	Saginaw	SCE-42P36	Saginaw Controls
26.0	LT-0005	1	Light Fixture: LED, 285 mm (11.2"), with Power Cable, On/Off Switch	Banner	WLB32ZC285PBQ MB	WESCO
26.1	ZS-0005	1	Light Switch: Door Activated	Hoffman	ALFSWD	North Coast Electric
33.0	RECP-0006	1	Receptacle: Panel Interface Port, Type 12/4/4X, 120VAC Outlet and RJ-45	Automation Direct	ZP-PSA-16-101	Quantum Automation
35.0	SPD-0002	1	Surge Suppressor: 120 VAC Nominal Voltage, Status Indication, Base Included	Phoenix	2907918	Stoneway
36.0	UPS-0009	1	Uninterruptible Power Supply: TRIO Series, Integrated 24VDC Power Supply, 120VAC Input, 20A, Battery Required	Phoenix	2906367	Stoneway
36.1	BATT-0012A/B/C/D	4	UPS Battery: SLA, 12VDC, 18AH	Interstate Battery	SLA1116	Interstate Batteries
40.0	CB-0001	1	Circuit Breaker: 20A, 1 Pole, Thermal Magnetic UL489	Eaton	FAZ-C20/1-NA-SP	Platt Electric
40.1	CB-0010 CB-0011	2	Circuit Breaker: 10A, 1 Pole, Thermal Magnetic UL489	Eaton	FAZ-C10/1-NA-SP	Platt Electric
40.2	CB-0006 CB-0007 CB-0008 CB-0014	4	Circuit Breaker: 5A, 1 Pole, Thermal Magnetic UL489	Eaton	FAZ-C5/1-NA-SP	Platt Electric
40.3	CB-XXXX	6	Circuit Breaker: 2A, 1 Pole, Thermal Magnetic UL489	Eaton	FAZ-C2/1-NA-SP	Platt Electric

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C	90% REVIEW	J. YAO	7/21/23		APPD. BY: J. YAO	CUSTOMER: WILSON ENGINEERING		P2125	
B	DISTRICT REVIEW	N. DEBOLDT	6/8/23		DATE: 2/1/23	CONSULTANT: QCC		DWG. NO.	
A	VALVE & INTRUSION I/O	N. DEBOLDT	5/17/23					D-02	
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Item No	Name / Tag No.	Qty.	Description	Manufacturer	Man. Part No.	Vendor
61.0	PB-0117	1	Pushbutton: Mushroom Head, 30.5 mm, Maintained, Red, NEMA 4X, 1 N.C. Contact	Allen-Bradley	800H-FRXT6D4	North Coast Electric
62.0	SS-0014, 0112	2	Hand Switch: 2 Position, 30.5 mm, Black Knob, NEMA 4X, 1 N.O. - 1 N.C. Contact	Allen-Bradley	800H-HR2A	North Coast Electric
71.0	CR-0004	1	Control Relay: 120VAC, DPDT, Indicator Light	Idec	RJ2S-CL-A120	Industrial Controls Supply
71.1	CR-XXXX	7	Control Relay: 24VDC, DPDT, Indicator Light	Idec	RJ2S-CL-D24	Industrial Controls Supply
71.2	CR-0121	2	Control Relay: 24VAC, DPDT, Indicator Light	Idec	RJ2S-CL-A24	Industrial Controls Supply
71.3	Control Relay - DPDT Slim	10	Relay Socket: DPDT Blade, DIN Rail Mount	Idec	SJ2S-07LW	Industrial Controls Supply
75.0	Terminals	90	Terminals: 600V, 25A, #12-#30 AWG	Allen-Bradley	1492-J3	North Coast Electric
75.1	Terminals	11	Terminals: Grounding, #12-#30 AWG	Allen-Bradley	1492-JG3	North Coast Electric
76.0	Terminals - Fused	34	Terminal: Fused, 1/4" x 1-1/4", Indicating 24 VDC LED	Allen-Bradley	1492-H5	North Coast Electric
76.1	Fuses	22	Fuses: 1/4 Amp, 1/4"x 1-1/4", Glass, Fast Acting	Bussmann	AGC-1/4-R	Industrial Controls Supply
76.2	Fuses	12	Fuses: 1/8 Amp, 1/4"x 1-1/4", Glass, Fast Acting	Bussmann	AGC-1/8-R	Industrial Controls Supply
78.0	Fuses - Drawer	1	Utility Box: DIN Mount, Drawer	Wago	709-591	Industrial Controls Supply
79.0	Ground Bar	1	Ground Bar: 12 terminal, copper alloy, Wire range #6 - #14 AWG.	Electric Motion	EM4251-12-SS-O	Electric Motion
80.0	PLC-0013	1	Programmable Logic Controller: CompactLogix, 2 Ethernet and 1 USB Ports, 24VDC Embedded 16 DC Inputs, 16 DC Digital Outputs, 4 High-Speed Counters, 4 High-Speed Counter Outputs, 4 Universal Analog Inputs, 2 Analog Outputs 8 I/O Expansion	Allen-Bradley	1769-L24ER-QBFC1B	North Coast Electric
82.0	PLC DI	1	Digital Input Module: 16 Inputs, 24 VDC	Allen-Bradley	1769-IQ16	North Coast Electric

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APPD. BY: J. YAO	CUSTOMER: WILSON ENGINEERING
DATE: 2/1/23	CONSULTANT: QCC

Division 7 Reservoir Replacement Project

Bill of Materials

QCC PROJECT NO. P2125
DWG. NO. D-03

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Item No

Name / Tag No.

Qty.

Description

Manufacturer

Man. Part No.

Vendor

83.0

PLC AI

1

Analog Input Module: 4 Isolated Inputs, 0/4-20 mA

Allen-Bradley

1769-IF4I

North Coast Electric

90.0

OIT-0014

1

Graphic Terminal, Standard Model, 5.7 in. Display, TFT Color, TouchScreen, Single Ethernet,18-30 V DC

Allen-Bradley

2711P-T6C21D8S

North Coast Electric

91.0

ETH-0015

1

Ethernet Switch: Unmanaged, Five 10/100BaseTX RJ-45 Ports, 10-30 VDC

Phoenix

1085039

Stoneway Electric

95.0

CELL-0016

1

Sierra Wireless AirLink RV55, LTE Cat 4, Input 7-36VDC
** Activate under LWWS D Private Network Account. **

Sierra Wireless

RV50X

Astral Communications

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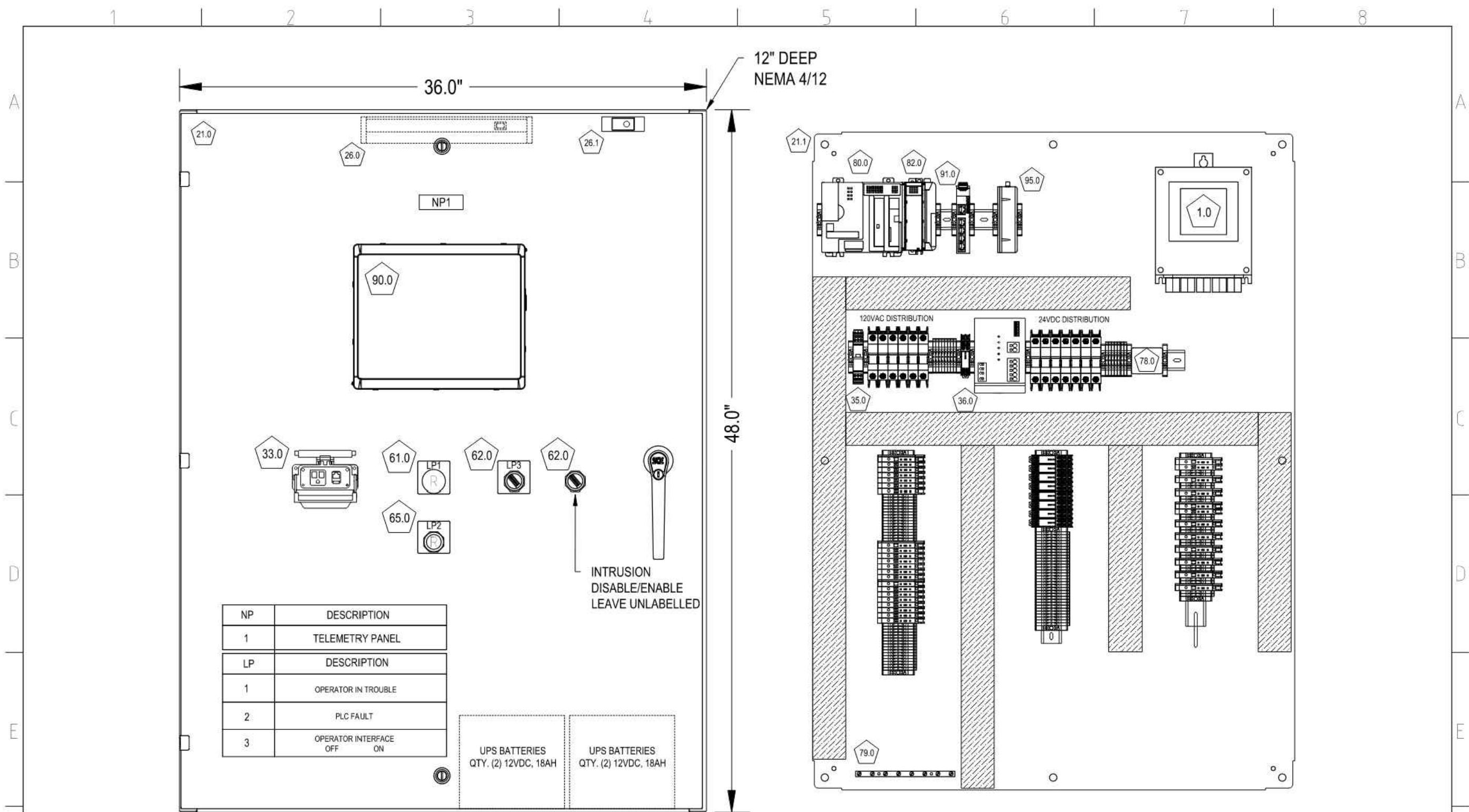
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LABELS: ① ② ③ ⑪
ENVIRONMENTAL TYPE 4/12, USE TYPE 4/12 CONDUIT HUBS & FITTINGS TO MAINTAIN RATING.

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	C	90% DESIGN REVIEW	J. YAO	7/21/23	APPD. BY: J. YAO	CUSTOMER: WILSON ENGINEERING		
	B	DISTRICT REVIEW	N. DEBOLDT	6/8/23	DATE: 2/1/23	CONSULTANT: QCC		
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TELEMETRY PANEL - PANEL LAYOUT DIAGRAM

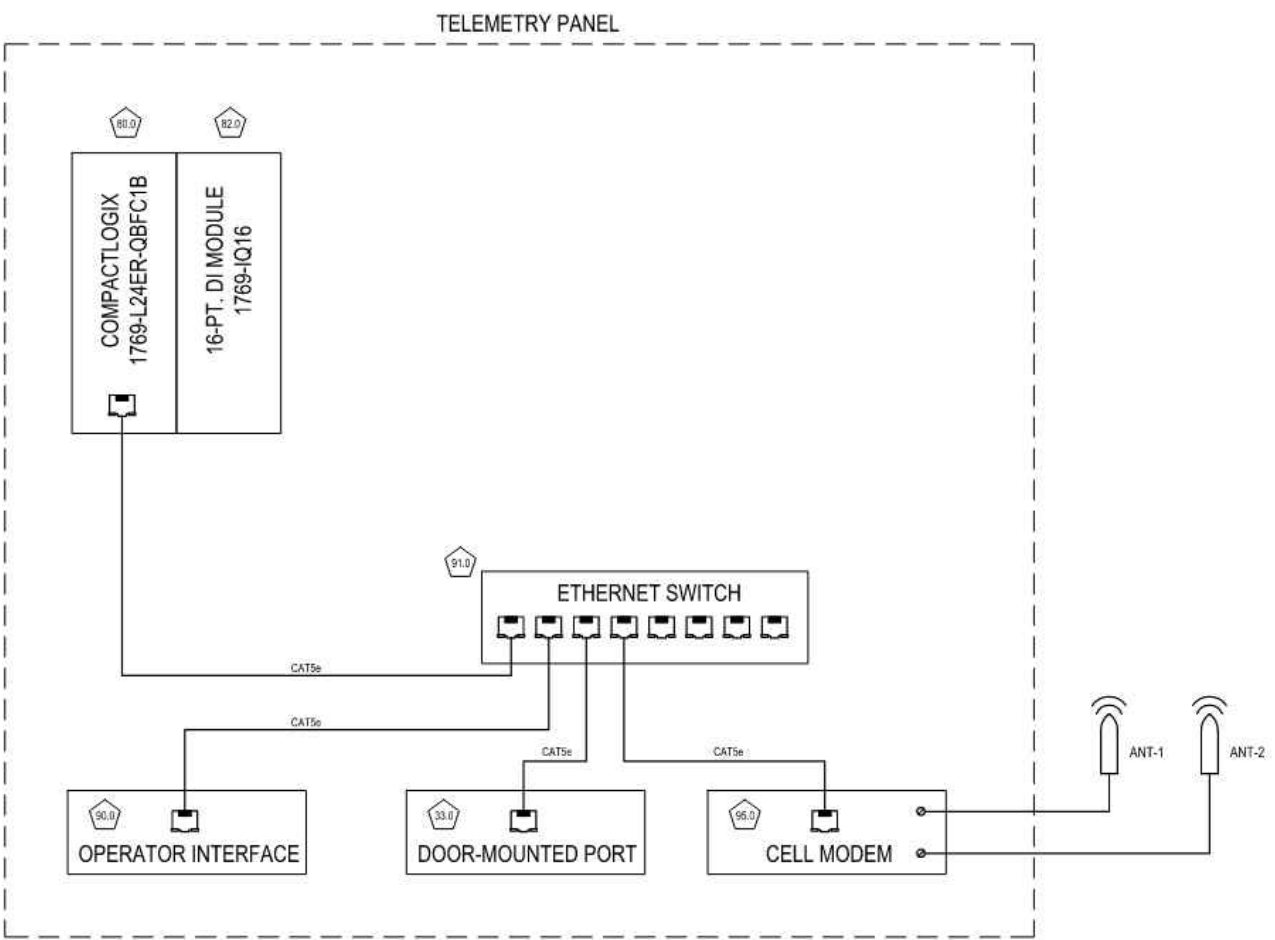
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B	DISTRICT REVIEW	N. DEBOLDT	6/8/23						
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							Network Diagram		DWG. NO.
							Communications Layout		N-00



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NETWORK DIAGRAM - COMMUNICATIONS LAYOUT

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10-17-2023

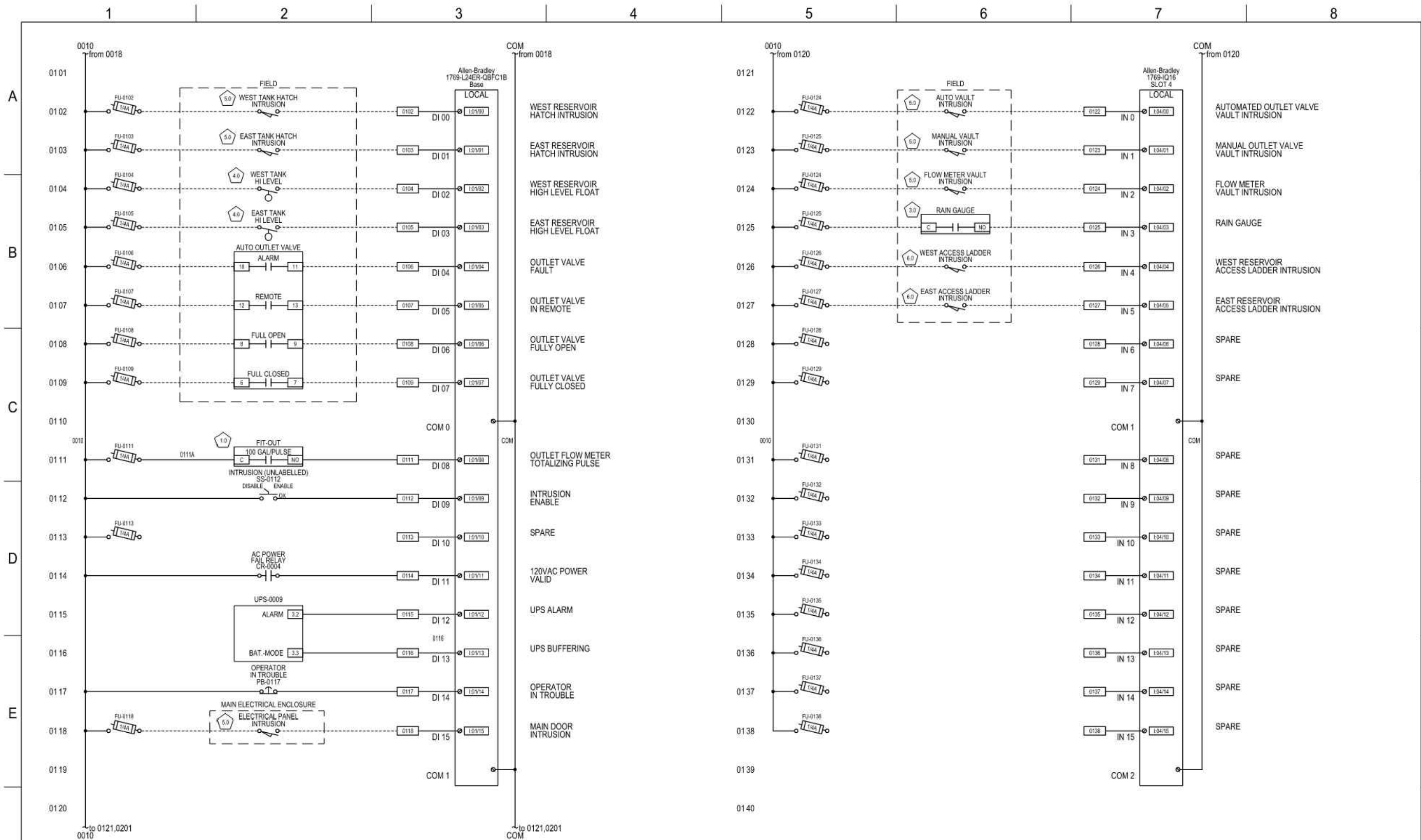
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C	90% REVIEW	J. YAO	7/21/23												
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DIVISION 7 RESERVOIR REPLACEMENT PROJECT

TELEMETRY PANEL, PLC DIGITAL INPUTS - CONTROL WIRING DIAGRAM

DATE

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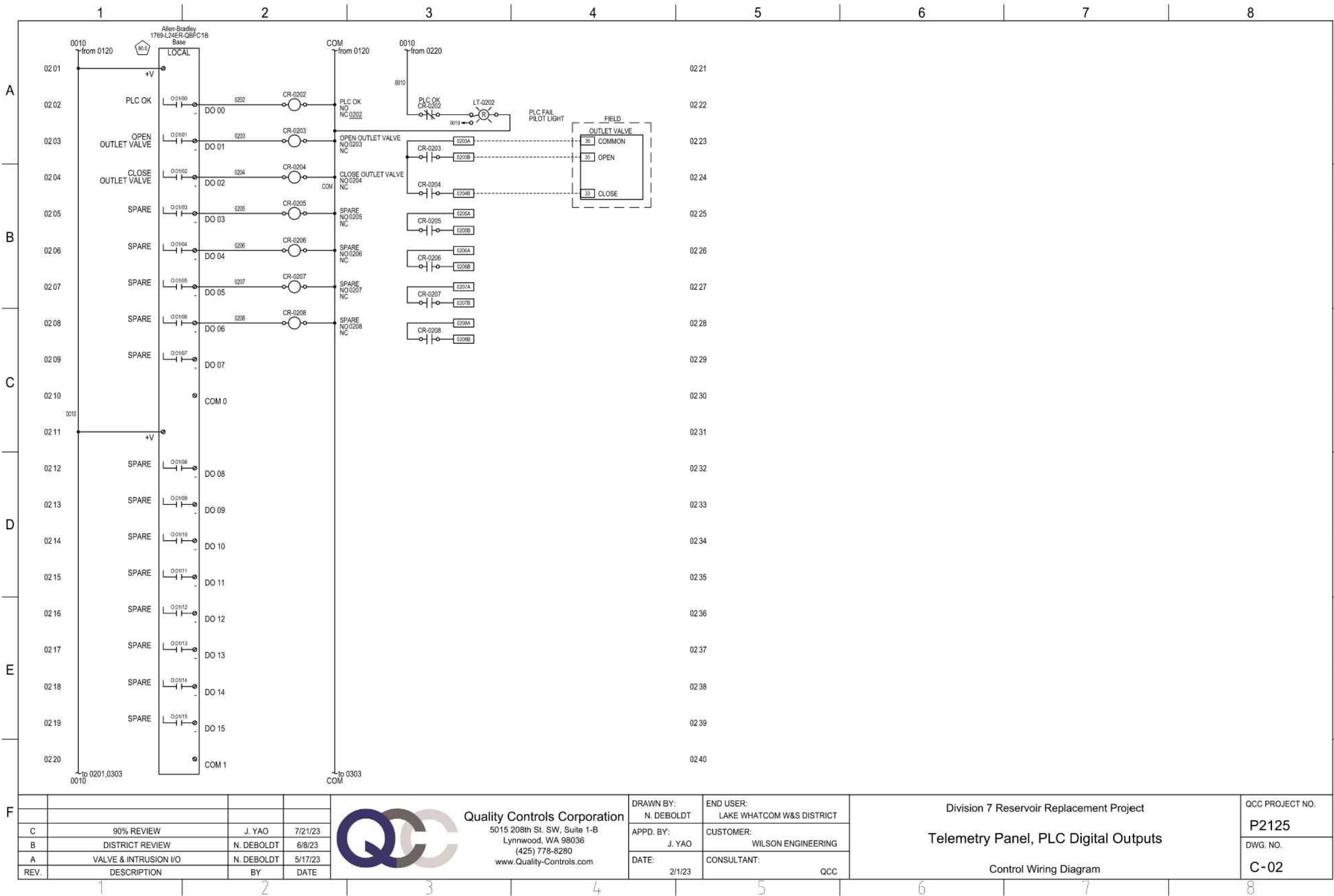
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APPD. BY:	J. YAO	CUSTOMER:	WILSON ENGINEERING
DATE:	2/1/23	CONSULTANT:	QCC

Division 7 Reservoir Replacement Project
Telemetry Panel, PLC Digital Outputs
Control Wiring Diagram

QCC PROJECT NO.	P2125
DWG. NO.	C-02

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DIVISION 7 RESERVOIR REPLACEMENT PROJECT

TELEMETRY PANEL, PLC DIGITAL OUTPUTS - CONTROL WIRING DIAGRAM

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C-02

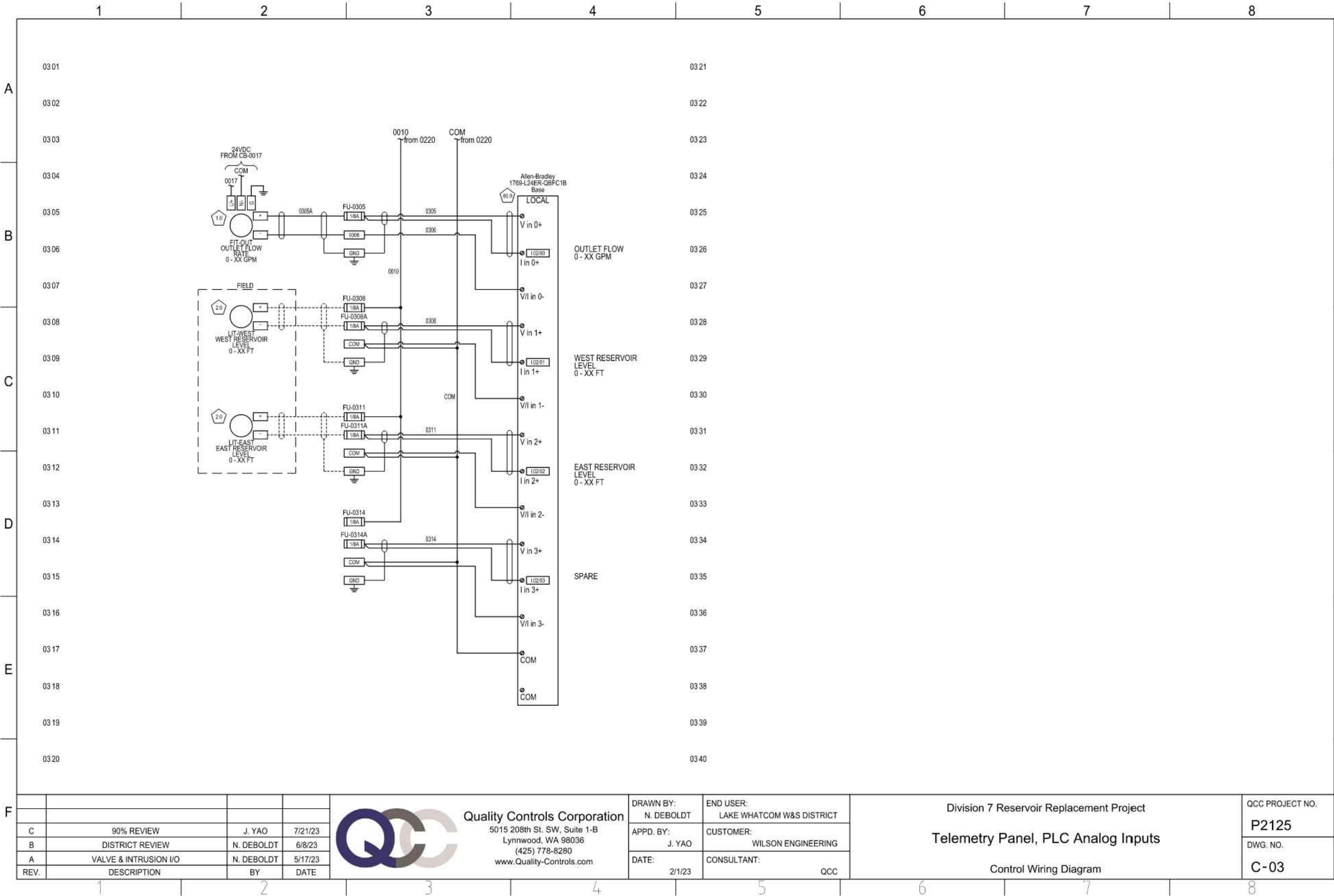
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10-17-2023	AS SHOWN	2021-130

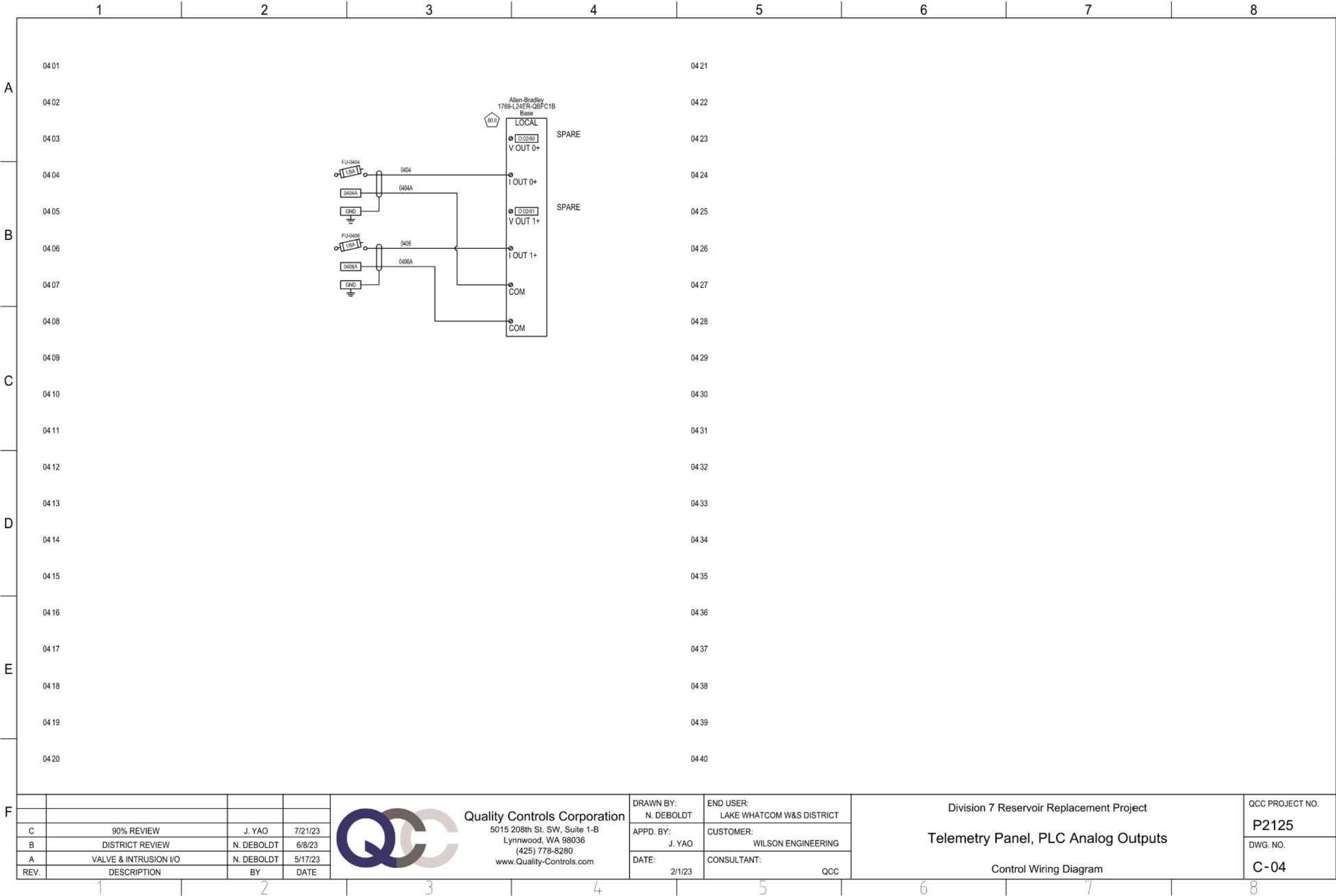
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